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# East Europe Report

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17 January 1986

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AGRICULTURE

GERMAN DEMOCRATIC REPUBLIC

OFFICIALS CLAIM FARM PRICE REFORM PROMOTES WISE RESOURCE USE

East Berlin DEUTSCHE BAUERNZEITUNG in German Vol 26 No 34, 23 Aug 85 pp 6-7

[Article by Siegfried Doehler, deputy manager of the Office of Prices, Council of Ministers, and Dr Erhard Gerstenberg, acting deputy, Ministry for Agriculture, Forestry and Foodstuffs: "Thorough Analysis of the Effect of Set Prices in the Context of Planning in the Production Cooperation Groups"]

[Text] All the experiences from implementing the agricultural price reform confirm the fact that in the cooperation between crop and animal producers set prices have proven their value and enhanced the process of production cooperation. The partners have used them in order to increase the output of animal stocks using their own feed production, to increase the quality of accounting by the LPG's [agricultural producer cooperative] and VEG's [state farm]. Moreover, with the development and use of these prices there was success in penetrating deeper into the uniform reproduction process and in uncovering weak spots.

In order that set prices can also accommodate this role in the continuation of the agricultural price reform (see also DEUTSCHE BAUERNZEITUNG No 33, pp 6-7) it is necessary to analyze their effect thoroughly. Two questions are of importance in this for the LPG's, VEG's and their production cooperation groups councils:

- Are the existing set prices a genuinely real production standard for each partner in the production cooperation group, thus are profit and loss accounted for where they occur and accordingly must be taken care of?
- Are the set prices in line with the new conditions of expenditure?

Economic Differences Should Become Clear

The answers to these should lead to conclusions for shaping prices which will be in effect starting 1986. In the process consideration must be given to the fact that because of new industrial prices for agriculture production costs for feed will increase. In perfecting the set prices the LPG's, VEG's and their crop and animal production cooperation councils should rely on important experiences gained from working with the existing ones. Some of them are in what follows.

Thus, it has been repeatedly apparent that set prices play a decisive role in effectively shaping the uniform reproduction process and help mobilize reserves to increase production while simultaneously lowering expenditures. This requires developing them in a consistent manner on the basis of jointly developed yield and output goals and on the basis of costs which occur under natural and economic conditions. This is the most important prerequisite in order to express the actual performance of the partners correctly in the indexes of economic performance evaluation.

This is best managed by uniform set prices for all partners in a production cooperation group. If the production cooperation council wants to influence the development of the partners and for example lead those still weak in performance to the level of the advanced individuals then economic differences must first be made clearly visible. This experience was confirmed by Wolfgang Krueger, chairman of the Rollwitz production cooperation group council, Pasewalk Kreis, among others. In DEUTSCHE BAUERNZEITUNG No 17, 1985, p 7, he argued very appropriately that financial benefits via lower set prices for one partner are inadequate pressure to develop reserves.

Another important lesson is the fact that effective set prices must be the basis for a promising level of yields and outputs in crop and animal production. In shaping the prices effective in 1986, close cooperation with the maximum yield and output designs must be established more consistently than has been the case. Only then is the output-enhancing character of set prices correctly effective. However, if the point of departure is level of crop production which is too low for the site or if unjustifiably high prices are established for feeds, then the financial effects of the low yields will be noticed not in crop production, but rather in animal production. The latter will be burdened with unjustifiably high costs.

#### Stimulus to Use All Yield Reserves

If, however, because of low outputs in the stables, prices are established for feed which are too low, then production in crop production will take place with too low a profit or even at a loss. Then the farmers will hardly be interested in increasing production and quality of feed and the animal producers will have sufficient reason to exert pressure on increasing output.

It has also been proven necessary to establish justified relationships between the set prices for grain and coarse feed. They should promote full utilization of all yield reserves in coarse feed production and result in the most economical use of feed, especially grain. Balanced shaping of these prices is of the greatest enterprise-management and economic importance. The majority of the production cooperation groups in line with the guidelines from the Ministry for Agriculture, Forestry and Foodstuffs (1 January 1983) has set clearing rates for the formation of the set prices at the level of state manufacturer prices. In individual cases, however, M70 to 80 per deciton were established. As compensation appropriately lower prices were agreed on for coarse feeds.



In turn, such regulations can result in the fact that the agricultural enterprise achieves good economic results even if it only imperfectly utilizes the possibilities and reserves for coarse feed production. At the same time it can happen that the economics of pork production are substantially worsened. Thus it is extremely important to utilize the latitude in set prices in such a way that no partner is advantaged or disadvantaged and favorable conditions for comprehensive intensification develop.

Furthermore, it is of economic interest to properly stimulate production and utilization of feed root crops which produce a high yield of energy. Important experiences were collected here with set prices for feed potatoes.

Establishing them in line with the guidelines mentioned, thus at the level of the state manufacturer price, has demonstrated its value in all cases where only or predominantly feed potatoes are produced. If the share of foodstuffs or crop goods in the overall yield is high, on the other hand, expenditure for production is largely borne by the proceeds from the main product. Under these conditions it makes sense to establish the set price for feed potatoes lower.

In the case of coarse feed it has generally turned out to be correct to take the actual cost for production as the basis in establishing set prices. Intermediate crops are an exception. Their price should be lower than their value in order to promote the utilization of the yield potential of the site. The recommendation to agree on lower rates for pasture feed than for stable feed has also found broad agreement. Thus, the interest in taking animals out to pasture and in saving transport costs is promoted.

As far as the differentiation of prices for feed--which are established on the basis of cost according to quality--is concerned, we have learned this is used too timidly. This principle should prevail: without compromise, whatever is of use to the one partner (highest energy concentration) must also be of economic advantage for the other. But whatever is harmful to the one (low energy content) must not provide the other with a profit.

#### Vigorous Pursuit of Quality Also for Straw, Manure

Finally, set prices for straw, stable manure and liquid manure must be directed even more effectively toward increasing soil fertility. Studies showed that in 1984, in a number of LPG's and VEG's, no clearing rates were established for these products--often with the justification that each stalk of straw and every deciton of manure and liquid manure are beneficial to the soil anyway.

Then when these enterprises still used set prices they recognized what large reserves in respect to quantity and quality of organic fertilizers can thus be developed. So that increasingly more organic material is available and its effective use is promoted, the level of the prices even in the case of these important raw materials must be made strictly

dependent on quality. This is a prerequisite for likewise interesting the crop and animal production collectives in developing all reserves. Stimulating this economically also becomes more regarding and compelling because starting in 1986 industrial prices for mineral fertilizers will be raised.

#### Focus on Growth With Reduced Consumption

In the past year there has been frequent confirmation of the fact that balanced set prices make a decisive contribution to deepening relations between the production cooperation groups and help increase efficiency. Thus, they gain in importance. Increasingly they must focus on raising production and lowering costs per production unit.

Carefully analyzing cooperative prices and revising them for 1986 is therefore of fundamental importance for cooperation between crop and animal producers in the uniform reproduction process which is organized on a proportionate basis. Each of the economically individually responsible partners should get equal opportunities for further growth in performance. Effective set prices are thus also an important prerequisite for preparing the 1986 economic plan and discussing the plan with the cooperative farmers and workers.

12124/9190

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AGRICULTURE

GERMAN DEMOCRATIC REPUBLIC

LPG MANAGERS RELY ON AERIAL PHOTOGRAPHY FOR CROP ASSESSMENT

East Berlin BAUERN-ECHO in German 17-18 Aug 85 p 7

[Article by Heiner Grienitz: "Interflug Offers Agriculture a Broad Range of Reconnaissance Flights"]

[Text] Why are many LPG (Agricultural production cooperative) chairmen taking to the air these days?

Generally there can safely be several very different reasons for something like that. In particular cases, which we deal with in the following, there are specifically two. The first: Because LPG chairmen want to get an overview of their enterprises from a higher vantage point. The second: Because today Interflug provides the opportunity to the agricultural enterprises.

In addition to the widely known agricultural aviation which many LPG's and VEG's [state farm] like to use Interflug has an additional special operation which offers farmers interesting service. This--remote reconnaissance, industrial and research flights--had invited representatives of agricultural enterprises and kreis and bezirk councils to a colloquium on "Use of Photography Flights in the Work with Maximum Yield Designs" at the beginning of August.

Six L-41 remote reconnaissance aircraft from the CSSR, three AN-2 which are known from agricultural aviation and two Wilga-type small aircraft, two multispectrum cameras, several aerial cameras, oblique and hand-operated cameras are the good material-technical basis which the remote reconnaissance, industrial and research flights enterprise has available for aerial photography. The range of services for the farmers comprises inspection flights and photographic stills and shots which are made available to the agricultural enterprise as aerial survey photography, oblique pictures, color slides, color videofilms and camouflage pictures (multispectrum photographs).

Since this year Interflug has been cooperating with 10 agricultural enterprises in a users research program. One of the first LPG chairmen to take to the air was comrade Dieter Schumacher of the Rhinluch Dreetz LPG. His reason for the flight: "All areas of our enterprise under cultivation

have been improved, and I wanted to find out how the facilities are working. Today its no longer possible to do that on foot. Flying is the only 'practicable' alternative." According to Dieter Schumacher, flight gives the first overview as to whether the drainage is working well, where there are still waterlogged places and whether the irrigation facilities are optimally used, what the quality of soil preparation, fertilizing and cultivation was, among many other things.

Initial decisions on eliminating mistakes—if, for example, a drainage system is not working properly—or concerning the second application of nitrogen, in the case of grain, can be made right after the flight. Concrete determinations, for example: on changing the road network, field boundaries and field divisions, on locating windbreaks or new improvement facilities can be made from the photographs, slides and videofilms. Aerial photographs can by all means be used in this as planning documents. Very time-consuming measurements on the ground can then be partially eliminated.

Now the LPG chairman himself does not always have to take to the air. It can also be the production manager or another enterprise staff worker. The condition is that he must be fit for flying and very quickly find his bearings in the territory of the enterprise from the airplane. Costly minutes of flight can otherwise be very quickly wasted. To extend agricultural inspection flights, many colloquium participants suggested central training of agricultural cadres and the training of a few specialists for a kreis for this task.

Party colleague Dr Diethardt Vogel of the Beeskow field office of the WtZ [scientific-technical center] in Frankfurt/Oder has gone up several times for the Goerzig LPG. At the colloquium he was the most committed advocate of aerial photography flights. With a videofilm he showed how wet spots, soil compression areas, losses caused by winterkilling, cultivation errors, wild field roads, inferior growth on the headlands, among many other things, can be recognized from the air. He reported that in the Goerzig LPG there have been hard discussions in the work collectives about such aerial photographs. For example, about who fertilized the field whose strip fertilizing is so clearly visible from the air. Or who drove back and forth across the fieldgrass field in bringing out the liquid manure. In addition to the usages which were mentioned by Dieter Schumacher colleague Vogel pointed to the rapid recording of all areas under cultivation which are not being used or are being misused.

The colloquium revealed that estimating yield directly from the air and from photography and generally the use of the most modern method of reconnaissance from the air--camouflage pictures from multispectrum photographs--is still problematic. Both can be traced back to inadequate experiences.

If interested, please contact Interflug, remote reconnaissance, industrial and research flights, 1189 Berlin-Schoenefeld, Airport, telephone Berlin 6 72 73 49.

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AGRICULTURE

GERMAN DEMOCRATIC REPUBLIC

NEW STUDENTS, NEW CURRICULA CHARACTERIZE AGRICULTURAL FIELD

East Berlin BAUERN-ECHO in German 26 Jul 85 p 2

[Article: "New Curricula To Be Introduced Starting 1986"]

[Text] Starting with the 1985-86 apprentice year, approximately 20,000 leaving students will start an apprenticeship in agriculture. Boys and girls have a choice of 18 trades. Effective 1 September 1985 new designations of training jobs in agriculture, forestry and foodstuffs are obligatory for concluding contracts of apprenticeship. Dr Walter Richter, deputy minister for agriculture, forestry and foodstuffs, stated this in a press interview. He provided extensive information about the gradual introduction of new curricula in this economic branch, effective as of 1986.

This will involve further perfecting vocational basic training in order to better accommodate the requirements of social development and realization of economic strategy by a higher level of availability of skilled workers. Uniform basic agricultural training of the apprentices in animal and crop production in future will occupy 60 percent of technical training. Also in future, crop production apprentices will receive their practical training in animal production for 4 to 6 weeks, as will animal production apprentices in crop production. In the past, this route has proven to be best. In future, greater weight will also be placed on communicating the best lessons from practical experience and on findings of scientific-technical progress, including the key technologies. Skills and abilities relating to trades which are useful for individual housekeeping are also in the curriculum. Questions of socialist enterprise management and production cooperation groups will occupy a large segment.

Dr Walter Richter went on to say that 140 enterprise trade schools and enterprise schools with 5,300 instructors are available for vocational-theoretical training. About 12,000 cooperative farmers and workers work as instructors and lecturers in the LPG and enterprises of agriculture, forestry and foodstuffs. There are 41,300 boarding school places available for the apprentices. Every year 10,600 apprentices acquire the class C, E and T drivers license during their vocational training.

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AGRICULTURE

GERMAN DEMOCRATIC REPUBLIC

FARM MACHINERY MAINTENANCE PREVENTS FIRES AT HARVEST TIME

Schwerin SCHWERINER VOLKSZEITUNG in German 16 Aug 85 p 2

[Article by Andreas Klug: "Order and Safety in Agriculture Prevent Losses at Harvest time"]

[Text] The current situation in grain harvest makes it clear that this year cooperative farmers are also striving very hard to bring in the crops smoothly and with little loss. In the course of harvesting to date, specific measures for better order, discipline and safety have proven their worth. Yet there have also been losses.

A short circuit in the electrical system of a forage harvester on 6 August at the Grambow LPG [agricultural production cooperative] (P) resulted in a fire. It was possible to avoid greater damage because of speedy and prudent action while fighting the fire.

But this example shows how urgent it is to implement preventive maintenance on large harvesting, conveyer and blower equipment and daily control inspections before each use. At the same time safety from sparks from exhaust gas equipment on tractors, loaders, harvester-threshers, forage harvesters and W 50 must be guaranteed. It is necessary to regularly measure the temperature at dried fodder, hay and straw storage sites in order to effect restorage as needed if the temperature rises.

It is also important to have water ready for fire protection at the harvester-thresher complexes and during storage operations and to secure the harvesting equipment which has been shut off.

The managers, managing staff workers, safety inspectors of agricultural enterprises and the social forces, such as members of the fire protection groups of the volunteer fire department or volunteer helpers of the VP [People's Police] constantly carry out controls. These controls make it clear that in fire protection there are still violations of the law, and that the majority of fires which occur in agriculture can be avoided. In 1984, too, once again improper use of open fire, smoking in the vicinity of hay stacks, in barns and stables, igniting materials in the hands of children and fire sites which were not extinguished according to regulations were once again the most common causes of fire. Fires of substantial

consequence were also caused by deficiencies or defects in forage harvesters, tractors or other harvesting equipment. But reference must also be made to the checking of electric systems in particular in agricultural buildings.

Everyone should keep this in mind: a healthy work atmosphere, a high level of work safety and economic growth in output presuppose, first of all, observance of order and safety.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

OFFICIAL STRESSES KEY ROLE OF MICROELECTRONICS IN INDUSTRY

East Berlin STANDARDISIERUNG UND QUALITAET in German Vol 31 No 3, April 1985  
pp 62-63

[Interview with Felix Meier, minister for electrotechnology and electronics;  
date and place of interview not given: "Microelectronics--An Essential Base  
for Upgrading"]

[Text] [Question] Why do the production and application of microelectronics  
play a key role in upgrading in our economy?

[Answer] This key role is due to the fact that microelectronics combines our  
economic goal of achieving maximum materials and energy savings with the  
greater progress we have to make in automating the production process and in  
developing more effective products and export product lines. The upgrading  
is a result of the much more efficient utilization of available material re-  
sources and of the work capacity of our society.

For instance, in teleprinters, a few microelectronic building elements have  
replaced 900 mechanical parts, and the microprocessor U 881 weighing a mere  
5.4 grams has taken the place of 306 kgs of individual traditional components.  
Microelectronic measurement, calculating and automatic control technologies  
have made it possible to reduce the amount of energy which big chemical plants  
need for their production by about 30 percent. And the computer-aided develop-  
ment of production data for multi-spindle drill heads alone permitted the VEB  
Tool Factory Zella-Mehlis to save 14,000 hours of design capacity. In our  
ministry's area of responsibility, the use of microelectronics--it currently  
affects two-thirds of all production--made it possible in 1984 to shift about  
5,000 workers to other tasks. More than 25 percent of all savings in working  
hours, i.e., the work capacity of 11,000 workers, are the result of micro-  
electronics.

[Question] What bases have been established for that in our republic in  
recent years?

[Answer] Based on the strategic decisions taken by the SED Central Committee  
and the Council of Ministers in 1976 and 1979 to manufacture and utilize  
microelectronics in our Republic, our scientific-technological potential has  
focused on this central task, and the establishment of a microelectronics



industry has been carried out with increased vigor. At the same time, the chemical, metallurgical, mechanical engineering sectors as well as the glass and ceramics industries have contributed their share to developing the microelectronics industry by providing specific materials and equipment. Numerous combines have set up centers of their own for the broad application of microelectronic findings, such as the textile machines VEB and the Werner Lamberz polygraph combine. However, in such sectors as building trade and transportation as well, ways have been developed to employ microelectronics in an increasingly better way. Because of its consistent realization of the goals laid down in those decisions, the GDR is one of those countries which have their own microelectronic base.

[Question] What role has CEMA cooperation, especially with the USSR, played in this successful development?

[Answer] Progress in the microelectronics area has only been possible because of the close cooperation, from the very start, with our socialist brother nations, particularly with the USSR. Based on government agreements with the USSR and general agreements within CEMA, we are getting part of the building elements used in the Republic. Thus the shipments of electronic components agreed on in the Annual Records on the 1985 exchange of goods between the GDR and the USSR, are entirely based on that agreement.

The long-term GDR-USSR cooperation program in the areas of science, technology and production in the period up to 2000 also delineates the key elements of cooperation in the microelectronics area in terms of a division of labor. This includes, on the basis of joint research, the development of modern basic technologies, new building elements and microprocessors as well as the manufacture of specialized equipments and materials for microelectronics.

[Question] How does your ministry, as the most important producer of microelectronics, work with other sectors in this matter?

[Answer] The electrotechnology/electronics sector alone could neither manufacture microelectronic products, nor could it meet the goals set out in the 5-year plan, to save about 25 percent in materials and energy. Development and production as well as their widespread utilization require the cooperation of many sectors, in particular the contributions of users.

Of course, for the combines in our industrial sector, the task of manufacturing economically-needed and more and more productive microelectronic goods also calls for close contact with the recipients. This affects not only conclusions with respect to the functionality or continued development of our products but, increasingly, the demands on the electrotechnology/electronics industry that result from development and production as well as from application of microelectronic results in other areas. In more and more combines, microelectronic devices are being manufactured in appropriate centers or as part of the construction of rationalization machinery, or existing standard solutions are being augmented and adapted to their own requirements. This means, on the one hand, extremely differentiated demands on the complementary supplies our sector has to provide. On the other hand, both the production

and application of sector-specific solutions provide results which we must absolutely keep in mind in the general further development of microelectronics.

[Question] Why is it necessary for the accelerated upgrading and further intensification of our production to utilize microelectronics in the economy in a consistent manner?

[Answer] Accelerated improvement of our production--the 1985 economic plan calls for 32.1 percent in our sector--has two objectives: it is necessary to ensure, through product sales, a generally acceptable range of high-quality products, in demand both at home and in foreign markets. At the same time, we also must aim at minimizing the use of materials and time needed for their production as much as possible. Both tasks make comprehensive utilization of microelectronics mandatory. Likewise, international competitiveness--for the machine-building industry as well as for industrial consumer products--requires that they are equipped with microelectronics. For that reason, the 1985 plan for electrotechnology and electronics also stipulates that the share of our output affected by microelectronics must be expanded further.

Our economic strategy to improve our economic performance through comprehensive intensification while cutting costs, focuses on the need to rationalize and automate in all areas and on making continued progress in improving our products. Only by utilizing microelectronics in a comprehensive way can the speed be obtained that is necessary to upgrade and minimize our efforts. Computer-aided design is a particularly good example. With the help of so-called CAD/CAM work stations, the productivity of design engineers can be increased by 80-90 percent; expenditures for pre-production work are cut in half, and the transit time for new products decreases by 50 percent.

[Question] Are the high work productivity and net production growth rates in the electrotechnological and electronics combines a result of the targeted application of microelectronics?

[Answer] Through diligence and operational readiness, the roughly 480,000 workers in the electrical and electronics industry made it possible to achieve double-digit growth rates in their productivity and net production. The technologists, inventors and innovators have been working constantly to find even better solutions for technological processes, to rationalize and automate additional stages of production. In this, they have made systematic use of industrial robot technologies. About three-fourths of all rationalization equipments used by the industry has been designed and manufactured by the combines and enterprises. To a large extent, they have applied microelectronic solutions.

Our ministry's responsibility for intensifying, rationalizing and modernizing the production processes in all economic sectors makes it imperative for us to achieve, in the future as well, the high growth of production and work productivity.

[Question] To what extent are microelectronics also the basis for upgrading the consumer-goods production area?

[Answer] Not only do microelectronics increase the efficiency of machines and equipment, but their utilization creates consumer products that have significantly higher and, in some instances, completely new user characteristics. At the same time, the mass-power ratio is becoming more favorable and the energy consumption is lower.

At present, the electrotechnology and electronics industry manufactures consumer goods that make up approximately 18.2 percent of all industrial products; this reflects the growing use of microelectronics, primarily in radio and television products. Large scale integrated circuits bring about a significant improvement in user characteristics. This is similarly true for household sewing machines, automatic washing machines, refrigerators and cameras. Among the most recent examples are the new color TVs, modern electronic entertainment sets, the more advanced pocket calculators and quartz clocks which would not exist without microelectronics.

With the consumer-goods production increasing at an above-average rate, the range of goods will continue to widen in 1985 and, as planned, expand the availability of high-grade industrial consumer goods for our people and for export.

[Question] What do you consider to be the most important areas for utilizing microelectronics in our economy?

[Answer] The ninth session of the SED Central Committee emphasized that microelectronics are a critical link for up-grading production and increased productivity. With this in mind, the 1985 economic plan has determined the tasks for accelerated development, production and application. All sectors must make their contribution to the continued growth of microelectronic production, to raise its technological level and to expand the range of goods. The results of microelectronics must be applied everywhere at an ever faster speed to facilitate the overall rationalization and automation of entire production areas as well as the computer-aided preparation and management of production. For the development of improved goods for domestic use and for export--including high-grade consumer goods--as well as for the establishment of an appropriate production profile, the share of products affected by microelectronics is an important criterion for achieving the desired level. Finally, it is imperative to also make greater use of microelectronics in areas where they have already been instrumental in achieving first results. That applies to the material-and energy-saving optimization of technological processes as well as to the rationalization of information-processing routine processes.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

PRODUCT LINES EMPLOY INDIGENOUS SILICATES, FLUOROCHEMISTRY

East Berlin STANDARDISIERUNG UND QUALITAET in German Vol 31 No 3, April 1985  
p 66

[Article by Dr. Werner Dietzel, chemical division, Standardization, Measurement and Commodity Testing Office: "Development Concepts for Future Products and Processes"]

[Text] In accordance with the regulation on quality development and assurance, the Standardization, Measurement and Commodity Testing Office (ASMW) is responsible for supporting the directors general of the combines in designing and implementing a long-term quality strategy in the combine. This requires that they must have their own views on both, how to achieve the most effective development in the combine in general, and also of concrete processes and products.

The ASMW Division for Photochemistry and Chemicals has issued instructions for the development of product requirements specifications in the chemical combines and established requirements for the development and sharpening of refinement concepts. To prepare product requirements specifications, the directors general have been provided with quality standards for the leading products that are based on the design concepts. The following publications were used to elaborate the development concepts:

--Domestic and foreign publications on photochemical products, anorganic and organic chemicals as well as special products, which have been analyzed for years and stored on card catalogs, arranged by work sectors. These analyses focused primarily on summary articles and monographs with international trend assessments in specific product areas.

--Publications and requirements of foreign-trade enterprises and the Ministry for Foreign Trade on product quality development as a prerequisite for ensuring exports. Consultation of the comprehensive collection of catalogs at the Central Institute for Information and Documentation (ZIID) in Berlin yielded valuable data.

--Comments and needs of domestic users and cooperating partners with regard to the improvement of products, product groups and manufacturing processes.



--Test results of foreign product samples, examined by ASMW, combines or scientific installations.

These information sources are also used for current updating and for annual revisions of development concepts.

#### Using Indigenous Raw Materials

One focal point of the division's work is to develop such concepts for additional key products and product groups and to document appropriate changes. Based on already existing results that focus on new product development by utilizing indigenous raw materials, governmental quality standards have been developed for, e.g., silicon and fluorochemical products.

The production of chemical products with silicon as basic element and having the greatest possible degree of refinement, is an economically important task. In addition to less refined products such as water glass, which is made of sand (silicic acid) and soda (GDR production over 100 kilotons per year) and which serves as base material for many other products (among them some for the rubber, paper and building material industries), and silicon carbide, also produced from sand (GDR production more than 5 kilotons) and used as abrasive, there are organic silicon compounds with very remarkable properties.

In 1983, the ASMW set a government quality standard for an important product of this group. The improved quality which the producer, the VEB Chemical Plant Nuenchritz achieved within a short time period has ensured continued NSW (nonsocialist monetary area) exports. The higher quality level had also a positive impact on domestic users. Another example of the impact ASMW has had on the development and introduction of high-grade products made from indigenous raw materials is the group of molecular sieves, manufactured by the VEB Chemical Combine Bitterfeld.

Molecular sieves are products with a special space and pore structure which permit separation of substances in the liquid or gaseous state because of their varying molecular sizes. These are essentially alumina silicates that can be manufactured synthetically and entirely on the basis of domestic raw materials by using the above-mentioned water glass. As a result of systematic R&D work, for which ASMW set a governmental quality standard, a new product is being introduced into production whose quality parameters, including its life in the chemical plant indicate top quality. This type of molecular sieve is being used to separate linear hydrocarbons (n-paraffins) made from hydrocarbon mixtures resulting from crude-oil production. These n-paraffins are the basic material for obtaining biodegradable products and for production of protein concentrates. These new molecular sieves, besides being used in the home market, are also part of chemical facilities exports to the USSR.

In designing the governmental quality standard, a fine tuning of the established quality goal parameters was very important. This tuning, done by ASMW, affected the prospective producers and buyers (here process implementors) as result of actual world-wide comparisons, based on application oriented test samples.

## Fluorochemistry Becoming More Important

Next to the silicon chemistry, the fluorochemistry area is becoming increasingly important for research and development since the GDR has extensive fluorine-containing mineral deposits (fluorite).

Lately, fluorine-containing chemical compounds have gained importance in a number of product groups because remarkable properties could be obtained with them. This includes, among others, pharmaceutical products (even synthetic blood substitutes have been manufactured), surface-active materials for households and industry, substances for fire fighting and refrigeration as well as for pesticides and pest controls. Similar effects have been obtained with plastics and elastics. The degree of refinement, as expressed in the price ratio of fluorite and these fluorine compounds reaches 1:100.

The ASMW has influenced, and will continue to influence, the optimal expansion of fluorine-containing chemical products. In cooperation with scientific establishments and combines, the Ministry for Chemical Industry has worked out a concept for further development in this area. The ASMW has set government quality standards for specific products which will be part of the product requirements specifications. Thus a quality goal was set up for a fluorine product which, as part of the cooperation in the CEMA area, ensures the supply of fluorine plastics, particularly polytetrafluorine ethylene (PTFE). This quality objective guarantees top quality on a world-wide scale once production begins.

In summary it can be stated that, in addition to the consistent use of the literature, the detailing of product development concepts requires the cooperation of central government organs, combines and scientific establishments.

It is essential that the users, including foreign trade interests, as well as the results of examinations of real comparison samples, be part of this. The design concepts for economically important products and product groups must be prepared in line with party and government decisions and must be reviewed on a regular basis. These materials support ASMW's justified demands that it have an influence on quality assurance, especially for product requirements specifications.

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## ECONOMY

## GERMAN DEMOCRATIC REPUBLIC

## IMPROVED PRODUCT QUALITY ACHIEVED THROUGH INCREASED REFINING

East Berlin WIRTSCHAFTSWISSENSCHAFT in German Vol 33 No 6, Jun 85 pp 843-58

[Article by Manfred Kraft, Dr of Economics, Certified Mathematician. Born 1953, Scientific Assistant at the Central Institute for Economics, GDR Academy of Sciences; and by Udo Ludwig, Dr of Economics. Born 1943, Scientific Assistant at the State Central Administration for GDR Statistics. Original title; "On the Methodology of Quantitative Determination of Refinement in the National Economic Process of Intensively Expanded Reproduction" ]

[Text] As the Politburo report to the 9th meeting of the SED Central Committee emphasized, it will be important over the next few years to "take a qualitatively new step towards higher refinement of production" (Footnote 1) (E. Honecker: "From the Politburo Report to the 9th Meeting of the SED Central Committee", Dietz Verlag, Berlin, 1984, p 36). It is the main road (Footnote 2) ("Economic Party Strategy--A Clear Concept for Further Growth," Dietz Verlag, Berlin, 1983, p 92) for permitting, with an almost constant supply of raw materials, a growing social product to supply the population, the economy, and exports, by applying effective scientific-technical solutions in a consistent way. This requires, on the one hand, far-reaching thinking and practical measures in research, development and production to improve and realize refinement concepts and programs of the combines. On the other hand there already exists much production refinement experiences, which must be theoretically consolidated in order to develop new reserves for management and planning of this process (Footnote 3) (H. Koziolk: "Higher Refinement of Raw Materials and Products--Condition and Expression for Further Increase in Effort and Economic Growth", "Wirtschaftswissenschaft", Vol 10, 1980; K. Steinitz, "New Conditions for Economic Growth in the Eighties", Verlag die Wirtschaft, Berlin 1982, p 89 ff.; W. Heinrichs, "Comprehensive Intensification and Reproduction Theory", "Wirtschaftswissenschaft", Vol 7, 1984, p 976 ff.)

In this connection, the quantitative representation of production refinement is an important problem. Further progress in this area permits better estimates of the achieved state of refinement, and helps to improve recognition of the dimensions of the specific higher refinement tasks, which must be undertaken in the new phase of realization of the economic strategy. On the combine and sector level, there exist a series of

characteristics and criteria for the determination and evaluation of refinement (Footnote 4) (G. Jordan, K.-H. Reuss: "Economic Aspects of Increase of Degree of Production Refinement in the GDR", "Wirtschaftswissenschaft", Vol 3, 1982, p 363 ff.; W. Bachmann, K.-H. Bintig, Raw Material Refinement--A Determinant Direction of Development for the Economically Effective Utilization of Mineral Raw Material Resources", Ibid. p 372 ff.). For the capital replacement process at the level of the whole economy, it has, however, not yet been possible to represent refinement specifics in a quantitative manner. This is not only a question of correct instrumentation for the collection, measurement, and evaluation of refinement, but is primarily a problem of precise determination of the content of those things which must be quantized. This contribution will discuss a few points dealing with determination of refinement content and their consequences for economic measurement and effectiveness evaluation at a total economy level.

#### A Basic Problem of Refinement Content Determination

The manufacture of products with higher use value, is typical for production refinement. Its present state in industry is characterized by the material-economic utilization of lignite, the deeper fractionization of crude oil, greater use of plastics and elastomers, further development of synthetic fiber materials, improvements in refinement metallurgy, development of new ceramic materials and technical glass products and by microelectronics (Footnote 5) (G. Mittag: "Economic Party Strategy Serves Further Realization of Course of Main Task", Einheit, Vol 9-10, 1984, p 807 ff.).

Basically, two approaches have developed in the scientific penetration of these processes. One emphasizes the technical-technological approach, and the other the economic nature of the problem. This is the nature of the problem, since production refinement deals both with development of productive forces and the conditions of production. Refinement processes were for a long time exclusively the subject of either natural science-technical and technological studies or of investigations of various branches of economics. (Footnote 6) (H.-D. Hausteint: "Refinement and Innovation from the Economic View", Wirtschaftswissenschaft, Vol 7, 1984, p 1001 ff.).

From the view of refinement as an interaction of productive forces and socialist conditions, certain methodological problems result in content determination. From the view of technical-technological refinement, metallurgy has little in common with refinement chemistry, coal refinement little with textile refinement, and refinement in fruit growing little with refinement in the glass industry. A generalization of refinement content, seen from these specific viewpoints, has very narrow limits, since it is based on different goals and results of refinement processes, the required specific work phases, the needed machines, installations and materials, and the underlying scientific-technical knowledge and principles. On the other hand, the related specifics of productive force development often take second place in economic studies of refinement.

Thus refinement is sometimes considered generally synonymous with production (Footnote 7) (M. Buechner, H. Willems: "On Several Questions of Higher Refinement of Energy Sources, Raw Materials and Intermediate Materials Under Conditions of Intensive Expanded Capital Replacement", *Wirtschaftswissenschaft* Vol 9, 1984, p 1316), or the expected economic effect is considered the cause (Footnote 8) (see the informative report on a meeting of the research group "Planned Utilization of Product-Money Relationships" at the Franz Mehring Institute of the Karl-Marx University Leipzig, by R. Eberhardt, R. Kaestner, "On Politico-Economic Questions of Higher Refinement of Raw Materials and Fuels", *Wirtschaftswissenschaft* Vol 10, 1982.)

#### On Refinement Content in Production Process

An approach to the generalizable determination of refinement content from the view of productive force development is possible by an analysis of the labor process. By defining its factors, Marx has shown those simple elements, which form the basic structure of productive forces. (Footnote 10) (*Categories of Historical Materialism*, Dietz Verlag, Berlin 1978, p 121). These simple elements are an abstraction with which, freed from the concrete productive forces and the specific production conditions, those conditions can be generalized, under which labor can actually be effective as a goal oriented activity. In the section on the labor process it is stated in "Capital": "In the labor process...human activity ... effects through means of labor an a-priori caused change of the labor object... its product is a use value, a natural material, adapted through a change in form, to human requirements. Labor has combined itself with its object. It has been concretized, and the object has been processed ." (Footnote 11) (K. Marx, F. Engels: "Werke" [Works], Dietz Verlag, Berlin 1956-1968, Vol 23, p 195). In this way Marx defined the processing of the labor object as a general characteristic of each purpose-oriented productive activity. Its refinement requires additional definition if its content generally differs from manufacture. To find it, is a task of further research.

One task of refinement is the production of items of higher use value. This too is a characteristic of every purpose-oriented productive activity. In a labor process the use value of the labor object is absorbed as a forming element in the use value of the product. In this sense the labor product basically has a use value, vis-a-vis the labor object, which is not only new but also higher. But, this transition to greater use values contains further definitions which could in a specific instance allow general processing of a labor object to become a refinement process.

In this transition one deals with an objective situation in the labor process, which relates qualitatively different use values to each other, based on their level. One way towards solving this detailed problem of the labor process uses a measure, where the "magnitudes" of the use value of the labor object and labor product are compared with each other. The general question arises what the basis of such a comparison of use values might be. Is the basis derived from the use value itself, from the

requirement which it satisfies, or from the process which produces it? This question is answered differently in the economic literature. (Footnote 12) (Ahrends and Moebis measure refinement by the changed use properties of the product, vis-a-vis the labor object (see also K. Ahrends, G. Moebis "The Economic Program of Refinement--Politico-Economic Aspects (Theses)", "Wissenschaftliche Zeitschrift der Hochschule fuer Oekonomie 'Bruno Leuschner' Berlin", Vol 3, 1983, p 87 ff); other authors reduce this problem to the measurement of product quality).

According to Marx a use value is " a thing, that satisfies human needs of any kind through its properties. " (Footnote 13) (K. Marx, F. Engels "Werke", loc. cit. p 49). The satisfaction of human needs through appropriation of natural materials was the direct result of an undivided, unique labor process only in the beginning of the history of man. Today a raw material taken from nature possesses this use value only in very rare cases.

With the development of productive forces and production conditions, adaptation of natural materials to human needs was achieved through ever changing work processes, in which labor became socially more and more divided. The simple labor process has changed into a socially combined labor process and the products of its individual phases need no longer possess use values for the satisfaction of human needs in the immediate sense, but only " relative to the utilization which further labor makes of it ". (Footnote 14) (Ibid. Vol 42, p 278).

In the course of this development requirements have expanded and increased. They have separated, with the social division of labor, into those of production and those of consumption, i.e. into productive and consumptive requirements.

Each labor process and the requirement satisfied by its product is more or less closely related to a consumption requirement, which is the end purpose of capital replacement. The characterization of the labor product use value as a greater use value, compared to the use value of the labor object which has been included in its formation, the place of this use value in the system of requirements is not a primary consideration, whether it is a productive or consumptive, primary or secondary, real or only imaginary requirement. It is of importance, that the higher product use value, compared to the labor object use value, is brought about by labor processes. In drafts for "Capital" Marx wrote: " If one speaks here of 'higher' use values, one does not speak of morals, not even that the new use value assumes necessarily a higher rank in the system of needs. Grain which is made into liquor, is a lower use value than liquor. Each use value, which forms an element of a new use value, is a lower use value, compared to it, since it forms its elementary basis, and a use value is the greater, the more labor processes the elements, from which it is formed, have passed through; the more complex its existence is ." (Footnote 15) (K. Marx, F. Engels "Gesamtausgabe (MEGA)" [Marx Engels Gesamtausgabe], Vol 2/3.1, Dietz Verlag, Berlin 1976, p 51).



This relationship between the number of processing phases and the use value level is the usual case, but in some specific cases the situation may be different. (Footnote 16) (Examples are backwards integration, the elimination of manufacturing and processing phases in forward integration, and generally, elimination of processing and manufacturing phases. Such cases must be treated separately when the use value level above the processing level of the base material is determined. See also Footnote 22).

The processing level has not only a technical-technological side, but also an economic one. In socialist production the labor process and the value forming process are one. As a product, raw material or natural material resp. the base material, has absorbed a greater or lesser amount of human labor during its progressive adaptation to human needs in the various processing phases. Marx once described this as follows: "In different use values the proportion between labor and natural material is quite different, but the use value always contains a natural substrate". (Footnote 17) (K. Marx, F. Engels: "Werke" loc.cit. Vol 13, p 23). While during the transformation process human labor combines with the labor object into a labor product, labor power obtains the labor already embodied in the labor object, and adds further labor, one part, which is transferred from the labor means to the labor object, and another part, which it creates in the form of new value. Compared to the labor object, each labor product incorporates a higher quantum of social labor. (Footnote 18) (This situation is sometimes interpreted as transition to labor intensive products. What proportion of expenditures are formed actually in these "additional" manufacturing processes, depends on the totality of production conditions and their combinations in the particular process. This must be determined more precisely by empirical investigations of costs and other expenditures). It is "more value intensive". (Footnote 19) (W. Schliesser: "Structure of Developed Socialism and Socialist Goods Production" in "Contributions to the Theory of Goods Production and the Law of Value in Socialism", Institute for Economics Bruno Leuschner" Berlin, Research Report of the Section Marxism-Leninism, Berlin, 1983, p 21).

But not every arbitrary addition of social labor contributes to this value increase. Only that amount of labor contributes to a value increase, that is expended to the extent that it is socially required. The magnitude of this value increase in toto, and per product, depends on the state of labor productivity and on the general scientific-technical production level in the particular production sector. The greater the scientific-technical level of production and the labor productivity, the smaller is the value increase. But it is always positive. Thus the differing use value levels of products made of the same base material are mirrored in the hierarchy of values of goods. (Footnote 20) (What is generally true for production result measurements in terms of economic expenditures is also valid here, with some limitations. Since the magnitude of the value is also influenced by factors which do not have a direct relationship to the produced use value level, the relationship between the cited hierarchy of expenditure quantities and the use value

level is fundamentally often somewhat biased. There are however statistical measurement methods, which permit to factor out effects of unsuitable development trends of expenditure and use value levels).

In a developed production environment and with division of labor, an average ratio between labor and natural material is established in terms of use values. These ratios, which are based on different labor and natural materials, resp. labor and base materials, indicate the particular socially normal processing level of a certain raw material, resp. base material. This average processing level

(Footnote 21) (In contrast to the averaging in value determination, from an expenditure view, not only the individual enterprise expenditures are basic here, but also the different types of goods. The common reference point is the same raw material, or basic material, from which use values are manufactured. One deals here, so to speak, with a hierarchy of expenditure quantities in a twofold sense. Enterprise-operational expenditures for production of a type of goods form a hierarchy of the first order, and determine the product value, in the simplest kind of value determination, an average value results, which indicates the product value as part of all products of the same type. The thus formed average values form a hierarchy of the second order, for all types of products, which are made of the same raw material type, having followed the step process for that material. This hierarchy of average expenditures is again an average, based on which the totality of products made from one material can be classified into various groups. Its deeper political-economic meaning remains to be researched further.)

changes from material type to material type and divides the whole assortment of products made from one material, into three groups: goods with low, average, and high processing level and use value. According to their classification as higher use value, refined products are those, which excel through an above-average high processing level of a raw material. (Footnote 22) (In order to avoid erroneous product estimates in case of conflicts between use value level and degree of processing, the situation can be modified in the manufacturing process before backwards integration or elimination of process phases.

Refinement in an economic sense, deals with the production of value intensive products from an existing raw material or base material, has a production value level based on the above-average processing level of the labor object, and has an average use value level of the goods. The increase in use level by quality improvement is included in this.

In this more general sense, refinement is not only a matter of traditional refinement areas of the economy, but an economic situation which affects all sectors, those dealing with base materials as well as the processing sectors and the final branches of social production, the manufacturers of means of production as well as the producers of consumer goods. If the labor object, which is to be processed in an above-average manner, is a raw material, then raw material refinement is a task of the base material sector.



Higher refinement has, in this connection, not a goal of some increase in value and use value of production, but a goal which will raise, by use of modern technology and the production of new products, the processing level of domestic and imported raw materials and base materials beyond the up-to-now reached socially normal level and will thus raise the total level of production. For this, the total level of scientific-technical work in the economy and the broad utilization of the educational and qualification potential of the workers are decisive factors. (Footnote 23) (What changes in expenditure ratios this will cause, must be left for further studies. First empirical results show, that there is no strong deterministic relation between the processing level of the labor object and the level of used educational and qualification potential of workers. Utilization of this potential depends on further factors, which must be sought in the state of development of the material-technical base of the particular production phase.) One must achieve a state of labor productivity with the new products and modern technologies, which simultaneously surpasses the international level. The better this succeeds, the sooner it will be possible to realize domestically produced values in international exchange, both, the part which has been transmitted to the product by human labor, and the part which has been newly created.

Refinement causes structural changes, which leads to a shift of the production structure towards products with above-average processing levels of labor objects, which also requires rapid renewal of the production facilities. The crucial point for an effective course of development is a production of high use values which on one hand respond to the needs of the population, the economy and of export, and at the same time permit to completely realize the expenditures of human and concretized labor used for their production. (Footnote 24) (E. Garbe: "Socialist Rationalization and the Development of new Mass Materials", in "On the Socialist Realization of Industrial Combines " Akademie Verlag, Berlin, 1983, p 106 ff.).

#### Problems of Refinement Measurements from Economic Viewpoint

Production refinement is a task of all material processing combines and enterprises, branches and sectors of the economy. At the production branch level, the classification of products based on the processing level of the labor object can be managed by appropriate experts and is realizable in practice. The volume and the share of refined products of the total production of an enterprise, a combine, or a branch, can be measured accurately, based on branch-specific criteria. A good example is coal refinement:

In the coal sector of social production in the GDR, the quantity of lignite used for energy purposes uniquely determines the socially normal processing level of lignite. Coal refinement, however, provides byproducts in the form of high grade fuels or of substances, which are used for further processing into organic-chemical products. For this, coal is subjected primarily to thermal processes of gasification and degasification, precisely those processes which permit an above-average processing level

of the labor object coal. Byproducts of these processes are high use value materials, such as coke, tar and gases, but also ammonia, benzene, naphthalene, phenol and sulfur, which in turn are base materials for plastics, synthetic fibers, paint and explosive materials, pharmaceuticals, pest control and others (Footnote 25) (See "Lexicon der Technik", VEB Bibliographisches Institut, Leipzig, 1982, p 307). Similar relationships exist in other traditional production refinement areas, such as the chemical industry and metallurgy.

A point of departure for the branch-specific determination of refined products is the existence and unique determination of "in-line" sequential processing phases, more precisely, a linear step sequence of the production sectors, departments, enterprises, or combines participating in the production process of the particular material. The apparent existence of such a linear production step sequence within a branch disappears as soon as the production process is viewed from a level of the total economy, from the first to the last step. On the total economy scale the relatively independent operational, combine, and branch production sequences interlink in a continuity of parallel and sequential processes, into a total economic capital replacement process, where they are, at the same time, both, causes and results. (Footnote 26) (W. Heinrichs: "Comprehensive Intensification and Reproduction Theory", loc.cit. p 979). The original raw material must, because of the interdependence of production between the branches, combines and enterprises in this total process of social capital replacement, as Marx said, "pass through a whole sequence of different processes, where it functions as raw material, always in different form, up to the last process which delivers a completed means of livelihood or of production". (Footnote 27) (K. Marx, F.Engels: "Werke", loc.cit. Vol 23, p 197).

In this total process from raw material to final product of the economy the linear manufacturing processes of individual raw materials and base materials relate to each other on the individual branch levels, and the refined products of one branch become the material of another branch. Material flows of individual, manageable branch processes of raw materials or base materials blend into a unified material flow of the total economy, whose partial processes are interlinked with each other.

This interlinking is expressed in different forms. First there is the well known differentiation of industrial labor objects. (Footnote 28) (E. Garbe, D. Graichen: "Economic Use of Materials", Verlag die Wirtschaft, Berlin, 1976, p 29 ff.). Product lines are becoming broader, new processing methods, combinations of materials, mixtures of materials, and an increasing number of compounds are used. Second, with increasing partitioning of production and the division of labor, various raw materials, base materials and their processing results do no longer determine the labor object, it now is formed by whole building blocks and components. Third, almost all material processing branches also include raw-material producing phases. In general the material producing phases precede the material processing phases, based on the material flow. But in many modern production processes raw material- producing,

-transforming, -synthesizing, and material regenerating processes alternate with each other, augment each other and form technological units in many enterprises and combines. (Footnote 29) (Authors' Collection: "Material Economy of the GDR", Verlag Die Wirtschaft, Berlin, 1982, p. 154 ff.).

Fourth, the simple time and space sequencing of the production phases is becoming an interwoven network of combines, enterprises and branches. Traditional one-on-one relationships are becoming multistep production processes and even loops within the material production. As an example, investment goods branch products enter as substitute investments in branches, which, directly or indirectly, participated in their manufacture. Here the capital replacement process of a single product becomes a circular process. Fifth, the linear phase sequences of production in processing of individual raw materials do not necessarily correspond with each other, when seen from a heterogeneous end product view of the economy. Thus the chemical industry precedes agriculture in the sequence of food production, while the reverse is true in the production of clothing.

In connection with this and other processes the possibility of branch-specific evaluation of the production processing level becomes more and more limited as distance from the raw material branches increases. Now the question of establishment of refinement areas, as seen from the total economic view of capital replacement, poses a new question. This determination must be based on all branch interdependencies and on all raw materials and base products and must specify those areas of economic production in which raw materials are processed at a level above the reached social normal level, as seen from the total economy. Here raw material refinement appears no longer as final and highest processing step in the particular raw material branch, but it rather is a link in a long chain of production steps, which finally lead to an economic end product, which has been produced by even another branch. One must determine those branches, seen from the economic production flow, starting with the raw materials, through the processing branches, to the final producers of economic end products in the course of a capital replacement cycle, whose value and use level is based on the above-average level of processing of all used raw materials.

This task may appear unsolvable because of the dependencies of the branches on each other in the production process. The production structures of developed economies show more and more non-linear or circular relationships. But despite of these increasing, and on first sight dominant dependencies, a more detailed analysis shows, that over three quarters of all branch deliveries are based on a linear model of the production structure. Behind the many interdependencies and interactions of the branches usually exists a linear sequence of branch steps, from the extractive branches, through the processing branches, to the final producers. To define them in concrete terms for the whole economy is therefore no trivial task. (Footnote 30) (Naturally the problem of dependence of production at a particular processing level on the production of other branches also shows up in determination of refinement from a branch standpoint. Besides the actual labor object, the raw material



being considered, or its processed products, there may be other raw materials, or intermediate products used by other branches, or parts of the processed raw material may leave the process under consideration, and find use in other steps of branches as a labor object. In such structural analyses these interdependencies with other branches can as a rule often be ignored, because the linear character of the production process in the considered partial process structure dominates. This is especially obvious when partial linkage results are considered. In a model of the forestry - wood processing industry sector with over 10 subsectors, return deliveries occurred only in one place, which caused deviations from the strictly linear basic model, and also in the metallurgy area partial linkage results documented this dominant linearity.

#### Application of Network Models to Economic Production Step Sequences

For an economic analysis of production refinement it first is necessary to clarify that sequence of production steps within the clearly visible linkages and dependencies of all product groups, which does most closely resemble the product flow from raw material to the end products of the economy. Special methods were developed as part of the structural research to derive these step sequences. They are usually based on economic network models. Network models are highly detailed representations of the production and capital replacement process of an economy. They reflect not only the immediate relations between the individual branches in the production process by capturing direct material deliveries and other services quantitatively; beyond this, they also permit determination of complete resources for a certain end product of the economy. Added to the complete material expenditures are indirect expenditures. The complete expenditures thus include--summed over all previous production processes--that total production which assures simple capital replacement for production of the considered end product in all branches of the economy. Thus the economic network models show the linkages of the various product groups or branches with each other, and their linkages with the manufacture of the end products of the economy and the utilization of available raw materials and intermediate products.

In order to characterize the sequence of steps within the linked relations, which express the linear character of the economic production process from raw material to end product, and to measure their time variations, the network models are triangulated. (Footnote 31) (M. Kraft: "Measurement and Ordering of Economic Linkages According to Step Sequences of Branches and their Evaluation According to Macroeconomic Criteria by Economic Network Models", Dissertation, Central Institute for Economics of the GDR Academy of Sciences, Berlin, 1983, p 68 ff.) For this purpose rows and columns in a matrix  $A$ , whose elements,  $a_{ij}$ , cover the dependence of production of the  $j$ -th product group on the production of the  $i$ -th product group quantitatively, are simultaneously rearranged in such a way, that the sum of dependencies which oppose the basic direction of the economic production flow are minimized. This, at the same time, achieves that in the triangulated sequence, branch production is, as much as possible, only dependent on the production of the preceding branches.



$$\sum_{j=1}^n \sum_{k=1}^n a_{jk} x_j \rightarrow \max!$$

$A = (a_{jk})$  - Matrix der Abhängigkeit des Zweiges  $j$  vom Zweig  $k$

In this manner the triangulated step sequence approximates a pure step process, where each step is, as much as possible, only dependent on the previous step. Because of the attempted linear sequence of the individual branches, corresponding to the basic direction of the economic production process, the relation between each two branches, which correspond to this basic mode are called linear dependencies or displacements, and those which oppose the basic direction, circular dependencies or backwards displacement. Links within a branch and the resulting in-branch dependencies cannot be allocated either to the displacements or the back displacements and are not considered in the matrix triangulation.

In addition to the triangulated sequence of branches, i.e. that sequence which corresponds best to the basic direction of the economic production process, other global and branch-specific characteristics can be calculated, which permit statements about the analyzed production structure. The share of linear dependencies between each two branches in the framework of the generally valid interdependence of all branches with each other is called /triangulated degree of linearity/ of the matrix  $A$  and is designated  $L$ :

$$L = \frac{\sum_{j=1}^n \sum_{k=1}^n a_{jk}}{\sum_{j=1}^n \sum_{k=1}^n a_{jk}}$$

Here  $1/2 \leq L \leq 1$ . The greater the degree of linearity,  $L$ , the more the analyzed economic production structure corresponds to a linear model, and with  $L = 1$  there are no circular dependencies between the branches. Our investigations have shown, that the linear dependencies are not only the historical precursors of mutual interdependences between the branches, but that this linear basic model is also preserved in the circular branch structure. The linear branch arrangement is today still dominant in the manufacture of a single product, or a limited group of related products.

In addition to the question, to what extent the economic production structure can be approximated by the linear model, it is also important to measure, how the individual branches and their relationships fit into the other producers in this economic production structure.

$$LS_j = \frac{\sum_{j=1}^{i-1} a_{ij} + \sum_{j=i+1}^n a_{ij}}{\sum_{j=1}^n (a_{ij} + a_{ji})}$$

The sectoral degree of linearity of a branch,  $LS_j$ , places inputs to this branch, corresponding to the triangulated step sequence derived from preceding branches, and outputs to following branches into a ratio to

the total branch linkages, which also contain inputs from following branches and outputs to preceding branches. Thus the sectoral degree of linearity indicates how well the analyzed branch fits into the economic production flow from raw materials to end product. At the same time the branch classification permits, based on sectoral degrees of linearity, further statements on the production structure of the economy, since it is now possible to recognize subgroups within the linear branch sequence, which are related circularly to each other in a more than average manner. Examples are branches of the raw material industry, or such groups of branches, which form independent (parallel) sequences, such as production flows in metallurgy or in agriculture.

#### Experimental Calculations for Determination of Production and Refinement Steps from an Economic View

For determination of refinement branches in the economic production step sequence it is economically meaningful and possible, from a methodology standpoint, to group the branches according to their "distance" from the economic end product. Those branches, whose products have to pass through relatively many production steps before they are used as consumer, investment, or export goods are placed as far as possible towards the beginning of the sequence; those branches, whose products reach end use directly, or after passing through only a few stages, are located at the end.

In economies with highly complex branch linkages, a mechanical "counting" of remaining or already passed steps does not lead to a useful result, since an unweighted summing usually, because of the circularities, yields infinite results. This dilemma can only be overcome by economic weighting of the individual steps. If the individual, still to be passed, steps, are weighted with the extent of the utilized production, the still remaining "distance" to the end product can be approximated with the matrix of the total expenditures. (Footnote 32) (In the relevant literature direct expenditure matrices are usually used for triangulation. The thus obtained branch sequence reflects technical-technologically determined dependencies and is also partially determined by the share of the individual branches of the total economic product. In order to exclude this second effect, the coefficient matrix of direct expenditures is used for triangulation. It is our opinion, that among all possibilities for determination of economic step sequences by quantitative network models, direct expenditure coefficient matrices are useful for derivation of a technical-technological branch hierarchy, while the total expenditures matrix better serves to show the flow of primary resources, especially of raw materials, in their flow through the processing steps).

On the basis of experimental studies with a network model of 13 aggregated product groups, a production step sequence was developed, where 5 branches of the material production, depending on their position in the system of social division of labor, specialization, and cooperation, each furnish products which lie below, resp. above, the average processing level. (Footnote 33) (In this evaluation of the experiments, pure service

branches--traffic and communications, domestic trade--and other producing branches were excluded from the discussion because of their heterogeneous product structure.) As table 1 shows, these are the branches of basic materials industry and electrical manufacturing/electronics. (Footnote 34) (The classification of electrical manufacturing/electronics as a below-average level production step shows on one hand that it is placed after the base material steps, primarily metallurgy and the chemical industry. On the other hand it must be observed, that the data for the calculations go back to years, where production and application of microelectronics was still in its infancy. Here further calculations with more current data must be made to reach conclusive results).

With an aggregation level of only 13 branches, the results of the studies are naturally somewhat limited. Theoretical derivations and calculations with disaggregated figures confirm, however, that the triangulated degrees of linearity are largely independent of the degree of aggregation.

Of interest is the end position of forestry and agriculture in the triangulated sequence of the 10 branches of material production. This is, on one hand an expression of the high degree of technology and chemistry, which leads to the result, that a large part of the production is provided as input into agriculture, while the agricultural products move rapidly to the end user via the food industry. On the other hand the price basis used in this branch, with its undervaluation of agricultural products before the agrarian price reform of 1984, leads naturally to a statistically low processing degree. The reform of agrarian prices, for example, which now has become effective, will not only stimulate refined production within agriculture, but will also contribute to better define the place of agriculture in the economic process of capital replacement and to make it more useful for the refinement strategy.

The calculations permit, despite their experimental character, certain conclusions, for example, where from an overall economic viewpoint, the refinement steps of production are located. These steps are primarily branches of the metal working industry, the light manufacturing and food industry, and building construction industry, all branches and areas which have a large share of end products, in form of investment and consumer goods, for the needs of the population, the economy, and of export. More deeper insight will be obtained with disaggregated network models.

Higher refinement of production thus does not only include structural changes towards higher processing steps within the branches, but also structural displacements in the direction of the already mentioned production phases in the economic process of intensively expanded capital replacement.

The triangulated step sequence for determination of refining branches is of importance in two respects:

First, production refinements can be compared, without limitations, through the concrete form of the labor object. It must be observed that

Table 1. Production Step Sequence According to Distance from End Product of GDR Economy

(A) Stufen- folge	(B) Zweig	(C) LS <sub>i</sub> (Prozent)	(D) Stufenfolge der stofflichen Produktion	(E) Verarbeitungs- niveau
1	Energie- u. Brennstoffindustrie	88	1	(F) unterdurch- schnittlich
2	Metallurgie	91	2	hohe
3	Chemische Industrie	83	3	Verarbeitung
4	Baumaterialienindustrie	88	4	
5	Verkehrs- u. Nachrichtenwesen	75	—	
6	Binnenhandel	74	—	
7	Elektrotechnik/Elektronik	76	5	
8	Land- und Forstwirtschaft	89	6	(G) überdurch- schnittlich
9	Leichtindustrie	74	7	hohe
10	Sonstige produzierende Zweige	74	—	Verarbeitung
11	Maschinen- und Fahrzeugbau	83	8	
12	Bauwirtschaft	95	9	
13	Lebensmittelindustrie	88	10	

Triangulated Degree of Linearity, L = 84 Percent.

Source: Own Calculations.

Key:

Step Sequence (A)

- 1 Energy and Fuel Industry
- 2 Metallurgy
- 3 Chemical Industry
- 4 Building Material Industry
- 5 Transportation and Communications
- 6 Domestic Trade
- 7 Electrical Manufacturing/Electronics
- 8 Agriculture and Forestry
- 9 Light Manufacturing Industry
- 10 Other Producing Branches
- 11 Machinery and Vehicle Construction
- 12 Building Construction
- 13 Food Industry
- (A) Step Sequence
- (B) Branch
- (C) Sectoral Degree of Linearity LS<sub>i</sub>
- (D) Step Sequence of Material Production
- (E) Processing Level
- (F) Processing Level Below Average
- (G) Processing Level Above Average



the result of this comparison depends both on the position of the branches in the division of labor of the production process and also on the realized processing steps in the branch.

Second, it also becomes possible to evaluate the refinement of production within one branch more completely. Triangulation permits, for the first time, to determine an economically average processing level, which serves as a base for measurement and evaluation of the processing steps in a branch. This is a generalization of the material refinement category, which deals with the processing of one raw material, or base material.

These results of the empiric analysis can be summarized as follows: Production of economic end products proceeds in economies which are organized on the basis of division of labor in various branches in a predominantly linear sequence of steps. This sequence of steps, which can be determined with triangulation and network models, corresponds as closely as possible to the economic production process, from raw material extraction, through processing stages to the end product. This sequence also represents the step-wise process of expression of the use value of the end products. It thus represents the step-wise increase of the economic processing levels in the individual processing steps of the used materials. In order to evaluate the refinement in partial processes, it is therefore necessary to view this partial process in connection with the basic linear structure of the economic production process. The more this partial process contributes to progress towards the economic end products, the greater must the refinement in this partial process be assessed.

#### On Refinement Effectiveness Evaluation

With the transition to higher refinement steps of raw materials and to higher steps of production in the economic process of capital replacement as result of refinement, material consumption increases, as compared to raw material use. On the one hand this development opposes the tendency to decrease economic expenditures by lowering the production and material consumption. On the other hand the economic result increases. In each production and processing step new value is added to the labor object and this new value, created through human labor, accumulates, based on a simple formula

(Footnote 35) (In reality this relationship is much more complex. It is valid for the end product without substitute investments, and the product value of a product depends, because of the production linkages, directly or indirectly on the socially necessary labor expenditures for the manufacture of all other products)

beginning with extraction of raw materials, over their increasingly greater processing to the total value of the products, which leave the economic process of capital replacement as end products in form of consumer goods and means of labor, resp. in the form of export goods. The ratio of these two opposing tendencies is of importance (Footnote 36) (The possibility of more rapid output growth (produced national income), as compared to input growth (material consumption) has been mentioned in previous

discussions (W. Barthel, W. Karbstein: "On the Discussion on Some New Aspects in the Evaluation of Growth Relationships Between Gross Social Product and National Income as well as Between Departments I and II", *Wirtschaftswissenschaft*", Vol 2, 1967, p 202 ff.), so that refinement and production effectiveness can be unified. In other words: If effectiveness of social production is to increase through refinement, effectiveness of raw material utilization must at least increase more rapidly than the degree of processing (Footnote 37) (This becomes clear, when the numerical relation between material effectiveness, raw material effectiveness, and degree of processing is considered. If N is the produced national income, resp. end product, M the material consumption and R the raw material employment, the material effectiveness ME can be expressed as:  $ME = N/R:M/R$ ). The latter designates the ratio of material consumption to raw material employment.

Products, which are, because of their nature as above-average processed products, highly refined, must stand out above ordinary, non refined products, according to this law, by greater raw material effectiveness. Investigations on effectiveness of raw material employment (complete raw material expenditures) based on numerical value characteristics, have confirmed this principle. (Footnote 38) (See also investigations carried out under direction of G. Koehler at the Economic Research Institute of the State Planning Commission: "Economic Analyses on the Energy and Material Economy and on Import Utilization Based on Total Expenditures", Economic Research Institute of the State Planning Commission, Department Network Models, Berlin 1982, pp 3-9 and 16-21). The raw material effectiveness in production of products of the refinement branches of the economy in the sense of these step sequences had a tendency to appear greater than in the other branches. Deviations from this statement are due, rather to peculiarities of price formation in some branches, for example the food industry, rather than being challenges to the accuracy of the formula.

With the increase of the processing level of raw materials or base materials above the socially normal level at certain places of the processing cycle, from raw materials to final product, an additional expenditure of social labor in human and concretized form occurs. This additional effort of social labor in the refinement step, compared with production of non-refined products, must be balanced by a high use, so that the effectiveness of social production increases. This becomes possible when the higher use value of the refined products is capable of such a use in further processing and production steps. It thus becomes practically effective, so that the increased labor productivity of social labor, vis-a-vis the use of non-refined products can be saved to such an extent, that the additional effort in the refining steps is more than compensated. Only on the basis of such complex economic considerations can decisions be made, also in an individual case, on the economically best processing level. For this, detailed economic analyses are always required. (Footnote 39) (An important product-specific characteristic in this connection is the export kilo price (H. D. Haustein: "Refinement and Innovation from an Economic View)" loc.cit. p 1012 ff.)

In this complex situation refinement is a way towards increase of effectiveness of social production, which is characterized by an increase of use value of products as result of increased processing of labor objects, based on scientific-technical progress. Important prerequisites for this are a high level of labor productivity, not only in the refining phases, but in all phases of production, from raw product to the end product, of the economy, and an effective cooperation between all members of the total process of the intensively expanded economic capital replacement.

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CSO: 2300/79

ECONOMY

GERMAN DEMOCRATIC REPUBLIC

## SULFUR DIOXIDE, NITROGEN OXIDE EMISSIONS STUDIED IN DETAIL

### Limited Emissions Control

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 5 Sep 85 p 2

[Text] Leipzig, 4 September. Environmental protection, at least as necessary in the GDR (if not even more so) as in the FRG, manifests itself differently "over there" from "over here." There are no demonstrations, no public debates, no panicmongering. The East Berlin government has promised to protect the environment better--period! But belief in environmental protection and accomplishment of it are two different things. Environmental protection--at least for now--has only one goal: reduction of sulfur dioxide emissions.

The nitrogen oxides caused principally by motor vehicles are, on the contrary, not a government topic. Perhaps it is because the concentration of vehicles is still far from reaching the scale it has in the FRG or other Western countries in spite of all the progress; perhaps it is because, with the planned replacement of the GDR two-cycle "Wartburg" by the four-cycle engine of the Wolfsburg "Golf," East Berlin views the concern as at least partially alleviated. Also the problem of maintaining clean water or, more appropriately stated, of improving water quality has not yet been tackled, as far as one can determine from GDR publications.

So, the FRG government is once again hopeful that an agreement will finally be concluded on the nagging topic of keeping the international Werra River clean, under negotiation for years. Proposals for a technical solution are before the GDR. Even the financing, to which the FRG government must certainly contribute its not too stingy mite, seems to be no insurmountable obstacle. But the mills of the GDR grind slowly.

Things are proceeding in much the same way with the bids for reduction of sulfur dioxide emissions. Virtually all relevant companies from the FRG have submitted their documents with no order for sulfur scrubbing of smoke yet forthcoming. In Leipzig, the word was that at least two systems are under consideration. The bids from the FRG are competing with those from other countries, such as, for example, Japan or the United States. But, to date inquiries have been met with the comment that they are concerned about choosing the best and also the most cost effective technical solution. That



does not seem to be a mere excuse since there is a basic difference in sulfur scrubbing of smoke in the GDR from that in the FRG where power plants burn hard coal. The GDR energy supply, in contrast, is based on brown coal, the sulfur scrubbing of which possibly presents different requirements. The issue of the usability of the residue will also play a role in the decision of the GDR. Rumor had it that there was a desire to obtain sulfuric acid through the sulfur scrubbing, while a Krupp subsidiary offered a system by which fertilizer could be obtained through addition of ammonia.

The high costs of environmental protection are a further obstacle to a swift implementation of the goals on paper. The word from the builders of plants for the chemical industry is that new plants, which however will not be considered for some time, will all be equipped with the latest state of the art environmental protection systems. The same strict DIN standards would be applied there as in the FRG. Yet nothing is heard about any retrofitting of older plants--they make up the greater part of the GDR chemical industry. Thus, it will still be a good while before environmental protection in the GDR has reached at least the level currently criticized as being insufficient in the FRG.

#### Responsible Sectors Identified

West Berlin DIW WOCHENBERICHT in German Vol 52, No 30, 25 Jul 85 pp 337-46

[Text] In July 1985 in Helsinki, the International Environmental Protection Conference of the UN Economic Commission for Europe (ECE) added a protocol to the "Convention on International Air Pollution" concluded in 1979. According to it, by 1993 overall sulfur dioxide emissions are to be reduced to at least 30 percent below the 1980 amounts. Annual reports are to be made about progress and methods of measurement. The document was signed by 21 of the 34 ECE countries, including the GDR. The GDR Minister for Environmental Protection and Water Management characterized the task associated with the conference's commitment as very demanding.

In fact, sulfur dioxide emission in the GDR is currently exceptionally high. The DIW [German Institute for Economic Research] made a study of pollutant emissions and their regional distribution in the GDR<sup>1</sup>, the overall conclusions of which are presented here. In 1982, in an area less than half as large, in the GDR almost 5 million tons of SO<sub>2</sub> were emitted, in the FRG 3 million tons. In contrast, the situation with nitrogen oxide emissions is better (GDR: 0.4 million tons, FRG: 3.1 million tons). But, the methods mentioned by the GDR for the reduction of SO<sub>2</sub> emissions make a comprehensive reduction of the emission of these pollutants appear rather doubtful. The use of brown coal--especially high in sulfur compared to other energy sources--still predominates in GDR energy policy.

#### On the Determination of Pollutant Emissions in the GDR

For assessment and calculations concerning the emissions of SO<sub>2</sub> and NO<sub>x</sub> during combustion and manufacturing processes, in principle, two facts must be ascertained:

--the specific emissions factors related to the individual energy sources and processes as well as

--the respective consumption of energy sources or the level of production.

The specific parameters of the energy sources, the specific emissions and the processes causing them are in the GDR--as in other countries--frequently the object of studies. Individual data required for calculations are presented in monographs and specialized periodicals<sup>2</sup>. There are also reports on the level of production. However, it was frequently necessary to make estimates. It must also be noted that unambiguous data on emission factors frequently does not exist. For example, the sulfur content of brown coal from the same deposits, sometimes even from the same vein, varies greatly. The rate of fusion of the sulfur in the ash also varies. Thus, for the emission of SO<sub>2</sub>, there is a broad range of specific emissions. The differences in the data concerning NO<sub>x</sub> emissions are even greater; furthermore, significant deviations can even occur between calculated and measured amounts with this pollutant. In the interpretation of the conclusions, the area of uncertainty still surrounding these determinations should be taken into account.

#### Fuel Use

In 1982, the level and mix of primary energy consumption showed the following characteristics<sup>3</sup>:

--Primary energy consumption was 130 million tons hard coal equivalence (SKE). At 7.8 million tons SKE per inhabitant, consumption is relatively high (FRG: 5.9 tons SKE).

--Brown coal is far and away the most significant energy source; 276 million tons were mined and made up 63 percent of primary energy consumption. Since 1981, brown coal mining has increased, primarily to reduce dependency on oil and coal imports. In 1985, brown coal production will probably exceed 300 million tons.

--All other energy sources are of less significance: petroleum 19 percent, natural gas 10 percent, hard coal 4 percent, nuclear power 3 percent.

SO<sub>2</sub> emission depends on the combustion processes for the fuels used, the overall sulfur content and the proportion of sulfur bound in the ash.

On the other hand, for determination of NO<sub>x</sub> emissions, nitrogen content of the fuel has less influence. This emission increases with the combustion temperature.

The various brown coal deposits in the GDR differ from one another geologically in their basic parameters. The coal west of the Elbe is very old; compared to the younger coal of the region east of the Elbe, its caloric value, ash and sulfur content are very high, but its water content is lower<sup>4</sup>. But, even within a region or a vein, there are considerable differences<sup>5</sup>. So, for the strip mines of Espenhain and Zwenkau west of the Elbe, the sulfur

content of the coals from a single vein were found to be 2.1 and 4.5 percent<sup>6</sup>. The variations are also considerable in the second Niederlausitz coal-bearing horizon; sulfur contents between 0.3 percent and 1.4 percent are cited<sup>7</sup>. In emission calculation, these variations are taken into account as much as possible.

There are only general indications about the fusion rate of sulfur in the ash<sup>8</sup>. In this study, 30 percent was assumed for Lausitz brown coal and 40 percent for Leipzig brown coal; this corresponds to a respective combustion share of 70 or 60 percent.

#### Power Plant and Heating Plant Emissions

According to DIW calculation, in 1982, the power and heating plants in the GDR (including industrial power plants) emitted 2.91 million tons SO<sub>2</sub> and 0.18 million tons NO<sub>x</sub> (as NO<sub>2</sub>). With a 61 percent share for SO<sub>2</sub> and 41 percent for NO<sub>x</sub>, this area is the largest source of emissions in the GDR. The relatively high SO<sub>2</sub> emissions are attributable to the intensive use of domestic brown coal for electric and heat generation. Nearly 60 percent of the brown coal production of the GDR is converted into electricity and heat in power plants, an additional 10 percent used in heating plants. In 1982, brown coal power plants accounted for over 80 percent of the electricity production in the GDR. Due to the high proportion of brown coal, emission of NO<sub>x</sub> is comparatively limited since the combustion temperature of brown coal is relatively low.

For a total of 13 major power plants fired by brown coal, emissions were individually ascertained; for this the scope of production, the age of the installation as well as the caloric value, sulfur content and rate of fusion in the ash of the brown coal used were taken into account.

To avoid high transportation costs, power and heating plants are built in the vicinity of the brown coal deposits. The result is a heavy emission concentration in the regions around Cottbus, Halle and Leipzig. Lausitz has the highest pollutant emission rate. About 50 percent of the SO<sub>2</sub> and 40 percent of the NO<sub>x</sub> emissions from power and heating plants are concentrated here. It is true that the sulfur content of the brown coal used is lower than that in the Halle/Leipzig area. But that is also why most of the major power plants are located in this region.

The largest single emitter is the Boxberg major power plant located in the southeast. It has a total capacity of 3,520 MW, produces nearly 20 percent of the total electricity generated in the GDR and consumes approximately 30 million tons of raw brown coal annually. The calculated emission totals for this power plant alone are 0.46 million tons SO<sub>2</sub> and 21,000 tons NO<sub>x</sub>.



Overall emissions of about 0.30 million tons SO<sub>2</sub> and 45,000 tons NO<sub>x</sub> were calculated for thermal power stations. It should be noted that in 1982 almost one third of the natural gas production of the GDR was used in this area. Hardly any SO<sub>2</sub> emission results from the use of natural gas.

In 1982, before the substitution of brown coal for heating oil was complete, the clean heating plants emitted 0.34 million tons SO<sub>2</sub> and 34,000 tons NO<sub>x</sub>. SO<sub>2</sub> emission must certainly be higher now. Calculations from the GDR come to the conclusion that, "with complete abandonment of heating oil and use of solid fuels from domestic deposits, sulfur dioxide emissions caused by small steam generators will rise by 22 percent"<sup>9</sup>.

In spite of the high SO<sub>2</sub> emissions, industrial use of sulfur scrubbers has not yet begun. In the Vockerode power plant alone, a pilot system is in operation using the limestone additive process, in which a higher sulfur fusion rate results from the addition of limestone to the brown coal fuel<sup>10</sup>. This process is to be adopted in the future in thermal power plants in the Leipzig and Karl Marx Stadt regions<sup>11</sup>.

Since 1982, emissions from power plants has increased further. According to calculation, the Jaenschwalde power plant went into service with a capacity of only 500 MW; its total capacity is to be increased to 3,000 MW (1984: 1,500 MW). The result is additional emissions of 280,000 tons SO<sub>2</sub> and 14,000 tons NO<sub>x</sub> compared to 1982. Jaenschwalde is supposed to be the last major brown coal fired power plant built in the GDR. For the most part, nuclear power plants are to supply the increased future demand. The degree to which emissions from power plants can be reduced overall depends thus primarily on investments for sulfur scrubbing.

### Industrial Emissions

Data about the production and the respective specific emissions of the industrial sector (excluding industrial power plants) had to be studied extensively for coal refining, basic chemical, petroleum, construction materials, glass and ceramics industries and for a few other sectors. Concentrating on the areas causing the most significant emissions and their major production lines obviously means that the investigation cannot be complete. Presumably, approximately four fifths of industrial pollutant emissions are included. An exact assessment is however not possible due to the information sources.

The causes for the relatively high SO<sub>2</sub> emissions in the industrial areas chosen are, on the one hand, the greater proximity of GDR industry to its basic materials, on the other hand, the fact that brown coal comparatively high in sulfur is used as a raw material and as an energy source. In addition, the plants are often old, their technology obsolete and the condition of the equipment is not the best. In all the areas studied, many of the plants are older than 15 years. Old age and poor levels of efficiency are found especially in brown coal carbonization plants, the Winkler generators at Leuna, carbide production at Buna and Piesteritz, sulfuric acid factories, metallurgy, potash and paper pulp plants. In all these plants, pollutants



come from diffuse emission sources; they are, therefore, hardly calculable, much less measurable.

For 1982, calculations showed the following amounts of industrial emissions:

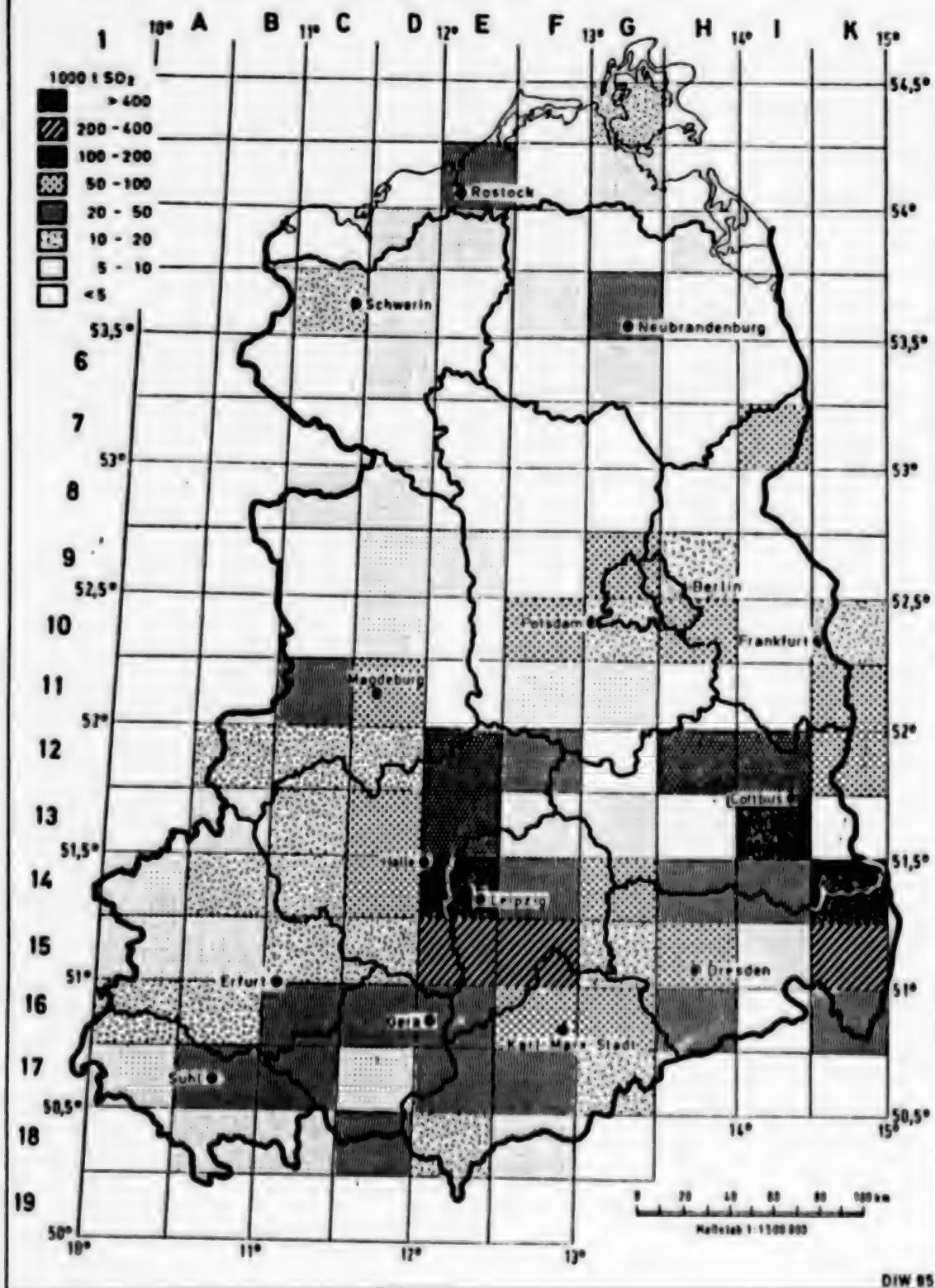
<u>Source</u>	<u>SO<sub>2</sub></u>	<u>NO<sub>x</sub></u>
	[in thousands of tons]	
Chemical Industry	508	35
Metallurgy	299	44
Construction materials, glass and ceramics	48	45
Total	855	123
Reported: Industrial power plants	700	29

According to these figures, the chemical industry is the largest industrial emitter of SO<sub>2</sub>. For production of substances and energy, the chemical industry uses 60 million tons raw brown coal equivalence, including half of the domestic natural gas. In 1982, 30 percent of all organic chemical products were manufactured based on brown coal. For that, 30 million tons of brown coal were necessary<sup>12</sup>. All coal refining plants are characterized by high contamination of the environment; this is true for sulfur dioxide emissions--to date, only a few plants use sulfur scrubbers for purifying waste gases--and especially for contamination of the nearby area through noise, dust, odors and polluted water.

The major coal chemical industries are carbonization, coking and pressurized gasification. The end products of carbonization are tar and low temperature brown coal coke (BTT coke). The tar bearing soft coal from the region south of Leipzig is used for this. Production was already to have been discontinued at the Espenhain, Boehlen and Deuben locations, but, as a result of the altered supply of raw materials, they were forced back into production beginning at the end of the seventies. In 1982, about 145,000 tons SO<sub>2</sub> were given off at the carbonization location. Further emissions result from the processing of BTT coke in the old Winkler gas synthesis plant in Leuna and from tar processing in Rositz and Zeitz<sup>13</sup>.

The end products of coking (Schwarze Pumpe Gas Company) are town gas and high temperature brown coal coke (BHT coke); very low sulfur coal is necessary for this. SO<sub>2</sub> emission is correspondingly low. Gasification--town gas is the end product--is increasing in significance. Gas can be utilized in almost all sectors of the national economy with relatively little harm to the environment and with good energy efficiency levels. With gasification, sulfur is economically recovered in large amounts; environmental pollution at the Schwarze Pumpe sites (Lauchhammer and Hoyerswerda) is nevertheless severe.

**SO<sub>2</sub>-Emissionskataster für die DDR 1982**  
 Table of SO<sub>2</sub> Emissions for the GDR--1982



Almost all of the basic chemical industry of the GDR is located within 50 kilometers of Halle. The largest chemical companies of the GDR, Leuna (large-scale synthesis), Buna (carbide chemicals) and Bitterfeld (electrolysis) operate here. While environmental pollution in the Halle region had clearly fallen off at the beginning of the seventies with substitution of heating oil and natural gas for brown coal, this trend was reversed at the beginning of the eighties<sup>14</sup>.

There are also high emissions in the manufacture of sulfuric acid, potash and paper pulp. Sulfuric acid production has predominantly obsolete plants; the potash industry uses large amounts of brown coal for drying processes, and in the paper pulp industry, additional SO<sub>2</sub> emissions result from the combustion of waste liquors. In contrast, petroleum industry plants are comparatively modern.

The metallurgical industry, especially "black" metallurgy, is the source of high pollutant emissions due to its obsolete production technology. In the production of crude iron and steel, the Siemens-Martin processes, particularly troublesome from an environmental standpoint, predominate. Through them alone, 170,000 tons SO<sub>2</sub> and 20,000 tons NO<sub>x</sub> are emitted. It is true that the new converter steel mill in Eisenhuettenstadt will replace a part of the Siemens-Martin production in the mid-eighties. But the GDR appears still to depend on the Siemens-Martin furnaces in Brandenburg and Hennigsdorf.

Production statistics for nonferrous metals are unknown. It is therefore difficult to assess emissions in the centers of this industry in the Mansfeld area (copper) and near Freiberg (tin and lead). Smelting plants also release emissions multiple locations. In 1982, there were SO<sub>2</sub> emissions of more than 50,000 tons. An absolute decline is to be assumed for both locations during the course of the eighties. Mandatory sulfur scrubbing will contribute to that<sup>15</sup>.

Emissions in the construction materials, glass and ceramics sectors are characterized by the fact that almost without exception their processes take place at temperatures above 1000°C. Furthermore, in the glass and ceramics industries, high quality energy sources (natural gas, town gas, light heating oil) are used. Therefore, the NO<sub>x</sub> emissions are barely lower than the SO<sub>2</sub> emissions.

Well over half of the industrial SO<sub>2</sub> emissions occur in the Halle/Leipzig region, that is, in the locations where high sulfur brown coal is the traditional basis of industry. NO<sub>x</sub> emissions are, of course, also high in this region, but there are likewise considerable emissions problems with this pollutant at metallurgy, construction materials industry and glass and ceramics industry sites.

In general, there will be declining specific pollutant emissions during the eighties in GDR industry on the whole. However, with production increasing further, an absolute reduction is unlikely.

## Household Fuel and Small Users

In this group are included many, mostly relatively small furnaces with chimneys less than 20 meters tall. In households, they are used for heating and for hot water as well as for cooking. The term "small users" includes a broad range of varied groups of consumers: workshops, restaurants, hotels as well as public services (e.g., schools, hospitals, libraries, administration). Total emissions for this sector were calculated in the amount of 950,000 tons SO<sub>2</sub> and 38,000 tons NO<sub>x</sub>.

To ascertain the emissions due to household fuel use--overall as well as regional--the breakdown of the housing supply according to form of heating at the end of 1982 was used as a basis. Of the entire supply (6.9 million), 4.8 million homes (69.3 percent) still used stoves for heat; 2.1 million were equipped with central heating. Of these, 1.2 million homes (17.4 percent of the supply) were heated by regional heating; in this case, the emissions do not occur at the location of the home, but rather at the heating or industrial power plants.

In 1982, brown coal briquettes (15.7 million tons), brown coal coke (1.2 million tons) and raw brown coal (0.2 million tons) were delivered to private households<sup>16</sup>. It was assumed that one fourth of the briquettes came from the Senftenberg area (Lausitz) and three fourths came from the Bitterfeld area (Halle/Leipzig).

An additional source of energy for heating is gas. To be sure, gas plays a very limited role in heating. For heating water, more than a seventh of the required heat is generated using environmentally harmless gas. In 1982, it is estimated that there were 4.5 million gas ranges or stoves. Newly built homes are predominantly equipped with electric ranges.

Based on optimal transportation, concentration of the consumption of Lausitz coal was assumed for the regions of Cottbus, Dresden, Frankfurt (Oder) as well as (East) Berlin; the use of Halle/Leipzig coal was assumed for the remaining regions. On the basis of special emission factors<sup>17</sup>, an annual total SO<sub>2</sub> emission of 600,000 tons was arrived at for households (heating, hot water, cooking). The NO<sub>x</sub> emission was estimated at 24,000 tons annually.

In 1982, brown coal briquettes (6.9 million tons) and raw brown coal (3.7 million tons) predominated, and limited amounts of brown coal coke (0.2 million tons), but also town gas (approx. 1 billion cubic meters) and natural gas (170 million cubic meters) were used.

A projection based on the various emission factors resulted in--with a separation of the brown coal component into Lausitz and Halle/Leipzig coal--an overall emission of about 343,000 tons SO<sub>2</sub> and 13,200 tons NO<sub>x</sub>. Of that, 99 percent of the SO<sub>2</sub> and 89 percent of the NO<sub>x</sub> came from solid fuels.

Future development in the area of household use and small user consumption will be characterized especially by the increase in regional heating with a simultaneous decline in heating by stoves (modernization of the housing supply). For emissions, that means a transfer from sources based on broad



areas to sources concentrated in points. However, there will not be much likelihood of any real change in fuel use in the direction of fuels with more favorable emission qualities; on the contrary, coke processing will probably fall off and the use of raw brown coal increase, especially with small users. Therefore, on the whole, only a very slight decline in emissions from households and small users can be expected by 1990.

#### Emissions From the Transportation Sector

Due to the special conditions and their significance in the transportation sector, emissions of carbon monoxide (CO) and hydrocarbons (CH) were also studied here.

The steady increase in transportation capacity for people and freight as well as the continual growth in the number of vehicles has developed the transportation sector into a pollution emitter, which deserves attention as in Western countries. According to the assessment of GDR scientists at the end of the seventies, transportation's contribution to overall air pollution in the GDR was approximately one fourth<sup>18</sup>.

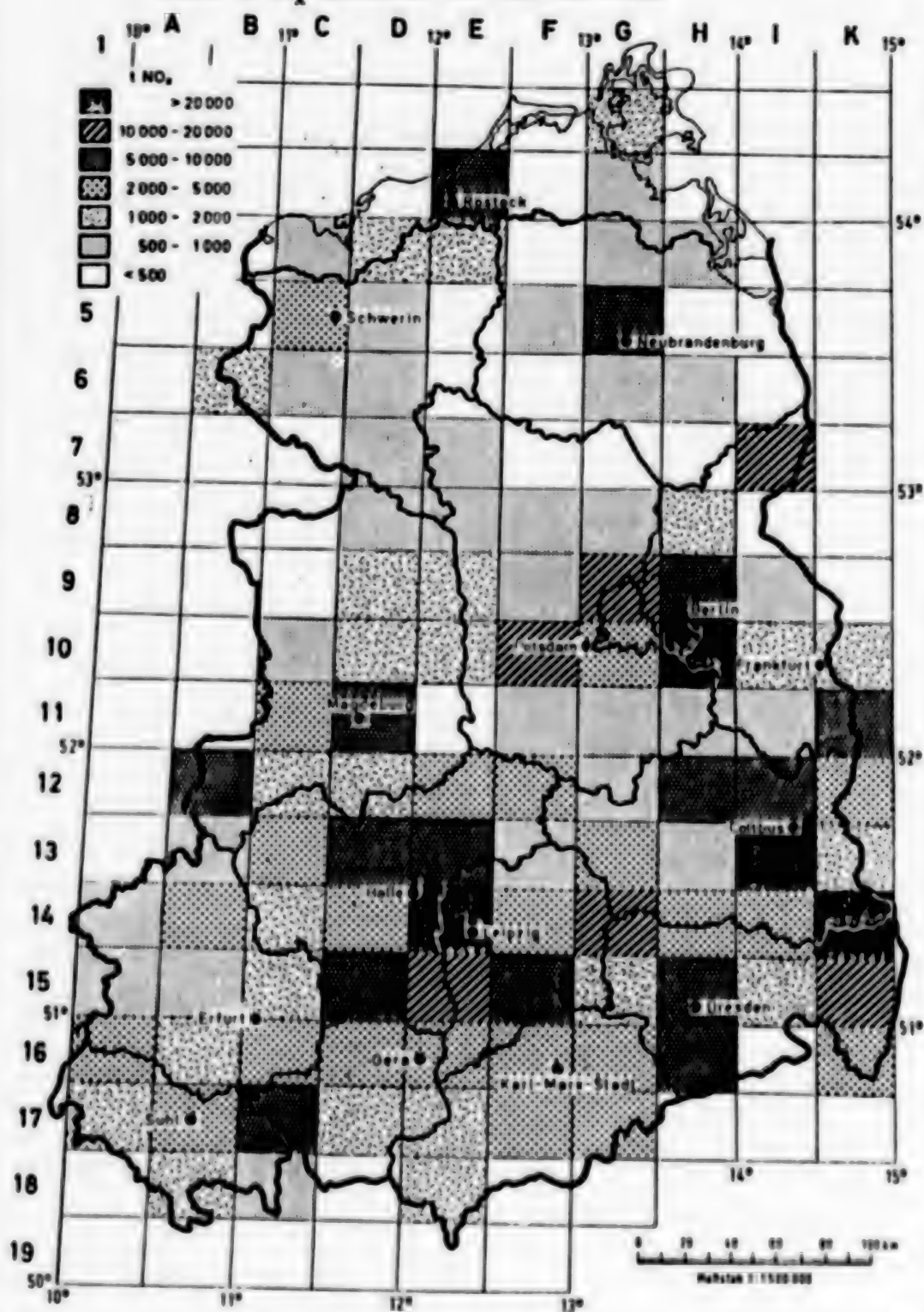
The major emitter in the GDR also is road traffic, already responsible in the seventies for up to four fifths of the total air pollution in the population centers of industrialized countries. At that time the GDR was not yet a highly motorized country. Nevertheless, according to the unanimous opinion of GDR authors, based on actual measurements, the population in high traffic cities was then already considerably threatened by pollutants from engine emissions in the GDR as well<sup>19</sup>. Studies at the end of the seventies showed that air pollution in urban population centers was up to 50 percent attributable to road traffic<sup>20</sup>, and, within that, predominantly to private passenger vehicle traffic<sup>21</sup>.

Characteristic of the mix of vehicles in private transportation in the GDR is the relatively high proportion of two-cycle engines (two thirds of all private vehicles). In contrast to four-cycle engines, these have a completely different combustion process, and, therefore, different emission behavior. Compared to a four-cycle Otto combustion engine, with the same drive capacity, two-cycle engines emit only about one tenth the nitrogen oxide, but about five to ten times as much hydrocarbon. In the GDR, CH emissions, consisting essentially of unburned fuel and representing a special danger for people, have reached with 0.5 million tons--in spite of considerably less drive capacity--almost the same amount as that emitted in the FRG by the entire transportation sector (1982: 0.6 million tons), while the NO<sub>x</sub> emissions are with 0.1 million tons considerably lower (1.7 million tons).

In spite of the higher sulfur content of GDR diesel fuel--approximately one fifth to one sixth of the corresponding amount for the FRG--, the comparatively low SO<sub>2</sub> emissions (18,000 tons), are essentially attributable, on the one hand, to the fact that there are virtually no diesel private cars in the GDR, and, on the other hand, that highway freight transportation plays only a secondary role in the domestic freight transportation system because of many legal and administrative measures--favoring the railroad<sup>22</sup>.

# NO<sub>x</sub>-Emissionskataster für die DDR 1982

Table of NO<sub>x</sub> Emissions for the GDR--1982



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Emissions of carbon monoxide (GDR: about 0.8 million tons; FRG: about 5.3 million tons), the most significant pollutant based on amount in both German countries, relate more or less proportionally to the respective amount of drive capacity produced.

Emissions in the Transportation Sector\* (in thousands of tons)

Source	SO <sub>2</sub>	NO <sub>x</sub>	CO	CH
Road traffic				
Private cars	-	33.0	780.0	460.0
Bus traffic	2.2	6.5	4.4	3.3
Over-the-road freight	6.7	23.0	13.2	10.1
Rail traffic	7.1	31.7	-	-
Inland water traffic	0.3	1.2	-	-
Ocean/harbor traffic	1.5	0.6	-	-
Air traffic	0.1	1.1	1.7	1.0

\*Including traffic to and from (West) Berlin.

Examining the types of transportation according to their contribution of pollutants, road traffic clearly dominates for NO<sub>x</sub>, CO and CH. For SO<sub>2</sub>, the rail traffic of the German Railroad (DR)--freight and passenger traffic--has, by itself, a total comparable (7,000 tons) to that of all road traffic. This is caused essentially by the fact that the railroad in the GDR, compared to the FRG, is considerably more involved in the inland transportation picture--a trend which is still increasing--, and is furthermore about seven tenths--based on gross tons per kilometer--powered by diesel with its (here) relevant emissions. The remaining pollutant emitters--inland water traffic, ocean/harbor traffic, air traffic--are relatively insignificant in this overall view.

Private motorization, which will certainly continue to increase, will inevitably bring an increase in pollution. Even if the attempt succeeds to reduce consumption of combustion fuels by the "Wartburgs" and the "Trabants" characteristic of the highway scene in the GDR and to achieve further improvements related to the specific emissions of pollutants, the increase will probably still be considerable. The long term outlook would be somewhat different if--as is being discussed frequently nowadays--the two-cycle engines were replaced by four-cycle engines. A comprehensive structural change in the cars on the road is, based on current information, not to be expected before the mid-/late nineties.

Over-the-road freight traffic is also not likely to become a significant polluter in the foreseeable future. As for the railroads, it should be

taken into account that the diesel locomotives which still dominate today (70 percent) will be replaced in the next few years as a result of the electrification of the rail grid of the DR to a large extent by electrical drive systems with the correspondingly lessened emission of pollutants in the transportation sector.

### Summary and Outlook

As conclusions of the study, the emissions of SO<sub>2</sub> and NO<sub>x</sub> in the GDR according to the individual emitter groups for 1982 are presented as follows:

<u>Source</u>	SO <sub>2</sub>	NO <sub>x</sub>
	(Millions of tons)	
Total	4.73	0.43
Power plants, heating plants*	2.91	0.18
Industry	0.86	0.12
Households, small users	0.95	0.04
Transportation	0.02	0.10

\*Including industrial power plants

Amount and structure of emissions are different, for example, from those in the FRG:

<u>Source</u>	SO <sub>2</sub>		NO <sub>x</sub>	
	GDR	FRG	GDR	FRG
Total (in millions of tons)	4.7	3.0	0.4	3.1
Share (in percentage)				
Power plants, heating plants	61.5	62.1	40.7	27.7
Industry	18.1	25.2	28.7	14.0
Households, small users	20.1	9.7	8.6	3.7
Transportation	0.4	3	22.0	54.6

In an area less than half the size (GDR: 108,000 square kilometers, FRG: 249,000 square kilometers), in the GDR, about 60 percent more SO<sub>2</sub> and about 90 percent less NO<sub>x</sub> are emitted. For purposes of comparison, it should be noted that the population ratio is 1 : 3.7 (GDR: 16.7 million persons, FRG: 61.7 million persons) and the ratio of economic production--based on the GNP--is 1 : 5. Under otherwise equal conditions, an environmental pollution ratio between 1 : 4 and 1 : 5 ought to develop. In fact, it is however 1 : 0.6 for SO<sub>2</sub> and 1 : 7.7 for NO<sub>x</sub>. As the presentation of causes of emissions has shown, this can be attributed to special structural characteristics in the GDR (brown coal, industrial and transportation structure).

If simplified, completely identical structural characteristics were assumed, the evolution of SO<sub>2</sub> emissions would be roughly connected to the consumption



of brown coal. However, in 1980, there was a total SO<sub>2</sub> emission of about 3 million tons; in 1985, about 5 million tons.

The Helsinki agreement to reduce emissions by 1993 to 70 percent of the 1980 level, means an SO<sub>2</sub> emission of about 3 million tons for 1993; that is approximately 2 million tons or 40 percent less than the projection for 1985.

For the reduction of SO<sub>2</sub> emissions, the GDR intends to implement, according to its statement in Helsinki, "a whole package of measures"<sup>23</sup>:

- reduction of energy consumption and preventable loss,
- increased use of secondary energy,
- heat and power linkage,
- further implementation of nuclear energy,
- supplying of regional heat,
- increased use of brown coal with greater removal of sulfur during refinement,
- use of fluidized-bed firing,
- sulfur scrubbing of smoke from large power plants, heating plants and thermal power plants.

The establishment of a national environmental inspection also certainly belongs on this list. Among other things, it should monitor air pollution, set limits and check compliance with them<sup>24</sup>.

The first five measures from the Helsinki list are aimed especially at reduction of energy consumption of fossil fuels, the last three at removal of sulfur from the brown coal used. The GDR has had great success in conservation of primary energy since the beginning of the eighties. Specific energy consumption was reduced, overall primary energy consumption only slightly--with considerable economic growth. The greatest conservation success was with petroleum; the use of brown coal has, however, absolutely increased. Per capita energy consumption, still very high, will make further reduction of specific consumption possible. Use of secondary energy, linkage of heat and power and regional heating could reinforce this process. Since the GDR is presumably striving for economic growth of 4 percent for the intermediate term, an absolute decrease in energy consumption is rather unlikely. The GDR intends to increase use of brown coal through 1990--although not to the same extent as through 1985<sup>25</sup>. An absolute reduction in SO<sub>2</sub> emissions is thus not to be expected from this part of the measures.

The planned increased use of brown coal should probably be based on the introduction of modern gasification processes. With these processes, an economic removal of sulfur (Claus system) is possible. The use of (Salzkohle) is already being tested in a pilot system. Expansion of brown coal gasification in a big way certainly requires considerable investment.

Sulfur scrubbing measures are still hardly used in the GDR. According to official announcements, the intent in the GDR is to concentrate on processes which are efficient and economical. This is hardly a realistic starting point. The use of all the considerable investments required here does not lie in the recovery of raw materials, but rather in the prevention of economically unjustifiable harm to the environment. An "economy" in the sense of industrial cost calculations, as the GDR seems to be striving for, is illusory in this connection.

Thus the obligation to reduce SO<sub>2</sub> emissions to 2 million tons below the current level is certainly a technically feasible, albeit a financially difficult task for the GDR to deal with.

#### FOOTNOTES

1. DIW Research Report, "Emissions Cadastre for SO<sub>2</sub> and NO<sub>x</sub> for 1982 in the GDR. Being prepared for publication.
2. For example, Herbert Mohry and Hans-Guenter Riedel, eds., "Reinhaltung der Luft" [Maintenance of Clean Air], Leipzig, 1981. Commission for Environmental Protection of the Presidium of the Chamber of Technology, ed., "Technik und Umweltschutz, Luft-Wasser-Boden-Laerm" [Technology and Environmental Protection, Air-Water-Soil-Noise], Vols. 1-29.
3. Only since 1982 have data on consumption of primary energy, solid fuels and brown coal been published by the GDR and even then only for past years. Up to 1978, these data closely agree with estimates determined from production and foreign trade data in the CEMA-energy database of the DIW. For the years 1979 and 1980, however, the GDR data indicates more limited growth of primary energy consumption. The differences must primarily involve petroleum consumption. The estimates used here run about 9 percent higher than reported by the GDR. Consumption of brown coal is however not included in that. Of course, the share of the individual energy sources in overall consumption is different. For brown coal, the supply share is 70 percent according to the GDR data. "Statistisches Jahrbuch der DDR 1984" [1984 GDR Statistical Yearbook], p. 151.
4. Herbert Krug and Wolfgang Naundorf, eds., "Braunkohlbrickettiering" [Brown Coal Briquette Manufacture], Vol. 1, Leipzig, 1985, p. 30 ff.
5. For example, in this regard, it has been pointed out by GDR authors "that the sulfur content of the 2nd Lausitz vein should absolutely not be considered as a parameter for the deposit." Approximately 50 percent of GDR raw brown coal is mined from this vein. Rainer Vulpius and Karl Heinz Neubert, "On the Distribution and Origin of the Sulfur in the Brown Coal of the 2nd Lausitz Vein," NEUE BERGBAUTECHNIK, Vol. 11, 1982, p. 656.

6. Dieter Bartnik, "Raw Material Properties and Quality Survey of the Brown Coals in the Northern Section of the Leipzig Bight," FREIBERGER FORSCHUNGSHEFTE, Leipzig, 1977, p. 81.
7. M. Suess, "Raw Material Basis for High Temperature Coking of Soft Brown Coal," ZEITSCHRIFT FUER ANGEWANDTE GEOLOGIE, Vol. 2, 1980, p. 75. The data for the "waterfree" analysis state were recalculated in the "raw" state assuming a water content of 58 percent.
8. For West Elbe coal, values from 40 to 37 percent were cited; for Lausitz coal, the data varied between 10 and 50 percent. Bartnik, op. cit., p. 51. Mohry and Riedel, op. cit., p. 76. Wolfgang Kluge, "IFE [Institute for Technical Research and Development, Austria] Processes for Sulfur Scrubbing From Smoke During Combustion of GDR Raw Brown Coal," ENERGIE-TECHNIK, Vol. 7, 1981, p. 276.
9. Wolfgang Schuster and Berthold Gartner, "Problems in Environmental Protection With the Conversion of Heating Oil Fired Steam Generators to Solid Fuels," Commission for Environmental Protection of the Presidium of the Chamber of Technology, ed., "Umweltschutz durch rationelle Energieanwendung" [Environmental Protection Through Rational Use of Energy], Vol. 27, Leipzig, 1984, p. 43.
10. On limestone additive processes, Wolfgang Kluge, "Levels of Sulfur Removal With IFE Processes for Grate Firing," ENERGIE-TECHNIK, Vol. 8, 1983, p. 318.
11. "Report of the National Central Administration for Statistics on Implementation of the 1985 National Economic Plan in the First Six Months," NEUES DEUTSCHLAND, 13-14 July 1985, p. 3.
12. Horst Weihs, "Chemical Processors Compete for Low Production Consumption," PRESSE-INFORMATIONEN, No. 8, 18 January 1985, p. 2. Eberhard Klose and Horst Brand, "Technical Situation and Developmental Trends in Coal Refinement in the German Democratic Republic," Address to the International Exhibitions Congress On Refinement of Brown Coal, Leipzig, 1985, reproduced on microfilm.
13. Guenter Scholz and Werner Hauptmann, "Coal Gasification of Brown Coal by the Schwarze Pumpe Gas Company: A Productive and Efficient Process for Generation of Town Gas and Synthetic Gas As Well As Liquid Products," Address to the International Exhibitions Congress on Brown Coal Refinement, Leipzig, 1985, reproduced on microfilm. Herbert Richter and Dieter Kalkreuth, "Role and Significance of the Raw Material Brown Coal for the Development of the Energy Industry and the Chemical Industry, Experiences and Perspectives in Coal Refinement," CHEMISCHE TECHNIK, Vol. 2, 1980, p. 61 ff.
14. G.F. Mueller, "On Air Pollution From Industrial Sources in the Halle Bezirk," Commission for Environmental Protection of the Presidium of the Chamber of Technology, ed., "Luftreinhaltung in der Industrie" [Maintenance of Clean Air in Industry], Vol. 15, Leipzig, 1977, p. 25 ff.

15. For example, Kurt Altnickel, "Air Related Health Problems and Possibilities for Assessment of Emissions Sources in the Nonferrous Metal Operations of the VEB 'Wilhelm Pieck' Mansfeld Company With Special Emphasis on Raw Smelting Processes," *ibid.*, p. 38 ff.
16. Oil is virtually not delivered anymore for heating purposes in households and communal housing administrations in the GDR. Oil heating systems, never very widespread, have been retrofitted for solid fuels.
17. The emission factors cited in the table are obviously higher than those used for SO<sub>2</sub> emissions for Leipzig brown coal (1368 mg/MJ [megajoule]) or for Senftenberg brown coal (150 mg/MJ) for (West) Berlin. However, it must be taken into account that briquettes delivered to (West) Berlin from the GDR are of exceptionally good quality with clearly low sulfur content (Leipzig: 2.14 percent, Senftenberg: 0.5 percent). They cannot be considered representative for the GDR. See Senator for Urban Development and Environmental Protection, ed., "Emissions Cadastre for Household Fuel Use--Berlin Source Groups for Heating of Buildings," (West) Berlin, 1981, p. 44.
18. See, among others, Mohry and Riedel, *op. cit.*, p. 23.
19. See, among others, Joachim Windolph, "Road Traffic and Environment," *DIE STRASSE, ZEITSCHRIFT FÜR FORSCHUNG UND PRAXIS DES STRASSENWESENS*, Transpress VEB Verlag für Verkehrswesen, Berlin, Vol. 12, 1977, p. 508; Windolph, "Environmental Pollution and Effects of Air Pollution," *DIE STRASSE*, Vol. 4, 1982, p. 117.
20. Helmut Walter, "Statutory Regulations for Environmental Protection in the GDR With Special Emphasis on Transportation," *INTERNATIONALE TRANSPORT-ANNALEN*, 1980, *VERKEHR UND UMWELTSCHUTZ*, Prague, Berlin, Warsaw, 1980, p. 19.
21. Cities and population centers with a high concentration of industry constitute an exception--obviously not from the total amount of pollutants emitted, but of the relative share here.
22. In this regard, also see Rainer Hopf, ed., "GDR: Freight Transportation Back to the Rails," *WOCHENBERICHT DES DIW*, No. 8, 1981, p. 83 ff.
23. *NEUES DEUTSCHLAND*, 9 July 1985, p. 2.
24. Compulsory levies could be collected for the implementation of regulations. "Decree on National Environmental Inspection," 12 June 1985, *GBL [GESETZBLATT] DER DDR*, Part 1, 1985, No. 19.
25. With reference to the 9th Central Committee Plenum of the SED of November 1984, it was announced at an international congress on exploration, recovery and refinement of raw materials and fuels at the 1985 Spring Exhibition in Leipzig that, as of then, a raw coal extraction of 320 to 325 million tons is planned for 1990. M. Mueller and P. Dittmann, "Complex Solution for Development of Deposits for Raw Materials for



Energy and Construction As Well As Processing of Raw Products," Address on 14 March 1985 to the International Exhibition Congress, Leipzig, reproduced on microfilm.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

#### RESEARCHERS NOTE NEED FOR IMPROVED OUTER WALL CONSTRUCTION

East Berlin BAUZEITUNG in German Vol 39 No 7, Jul 85 pp 295-297

[Article by Prof Dr-Ing Herrmann Ruehle, Dr-Ing Joerg Blobelt, Construction Academy of the GDR, Institute for Home and Business Construction: "Requirement for Building Development With an Eye on Energy and Material Expenditure"]

[Text] This article reviews research findings from this institute (/1/-/7/) already published and explains their effects on the development of buildings, in which case the work proceeded with a further intensive utilization of available funding from the Large Panel Building System with its further development. In this case the building outer shell (outer wall-roof) stands in the foreground. Accordingly, only a few significant appearing relationships and requirements are presented once again below.

#### Energy--Materials--Environment

The stormy development of the construction system into an industry, which is taking place in a relatively short time, as well as the changes in the needs of the populace have led to often underestimated changes in the rules of construction treasured over generations and at the same time to the necessity of introducing new rules. The complex relationships of energy, materials, environment, architecture, intrinsic value, technology, and economy have grown to be widely ramified. This influences the quality and sets new standards. Problems are open, are recognized, and also lend themselves to scientific investigation. However, only after years of practical experience one frequently comes to the "wisdom of hindsight." It is no wonder that complaints about building defects today interlace the international exchange of information.

The building shell represents an exacting and very comprehensive subject of high economic priority for the building practice and research, on which resolute and coordinated work must be carried out.

Already the intrinsic value being placed at the center of all considerations, as is known, looses a profusion of indeed quite contradictory requirements regarding roof and outer wall, which the user develops from his most different and unfortunately often more subjective than objective attitudes and experience.

Greater objectivity on the intrinsic value provides set rules from experience and science that are applicable and can be followed. It is certain that this complex relationship still needs many considerations and exerts a completely decisive influence on the investment in energy and materials.

Materials and energy, which is a one time and permanent investment, are in direct relationship and measurable. Saving materials remains a significant motive in each technical development, be it in the areas of substance, construction, or technology. Thinking only of minimum constructions, however, in the end need not lead to an economic effect since the total monetary investment and the intrinsic value are not directly related. Dedication to optimum construction is right! Such an action does not exclude light construction, above all when, for example, it succeeds in including more and more energy considerations. With this energy economy and energy gains could be likewise realized. Optimum construction also means for it to be designed for the period in which it will be used whatever happens and is realistic. The whole situation of industrial construction, accordingly not only new building materials and procedures, light construction, large sets, as well as new production organization, but also in this connection quality concepts not yet brought up and mastered and quality regulations influence the negative effects of the environment on the shell often more than its own intensification and amplification.

If we take as an example the corrosion of the reinforcing steel about which there are at certain intervals in time and spread over the whole world suddenly discussions tending toward hysteria. If the subject is thoroughly investigated, then the careless or unexpert construction often play more of a role than any so far unknown environmental effect. Analogous determinations can also be applied to cracking and soaking of weather protection layers of outer walls, to paint, joints, rain gutters during rain, snow, and ice, as well as many equally deposited substances. The often changed effects of the environment without a doubt that have become in part more complicated and also more aggressive, may never be considered to be independent. This can lead to serious errors in judgment. It is thus compelling to clarify the causes as objectively as possible and thereby to comprehend more the relationships between the environment and the construction including their details and technology. Precisely in this area research efforts are still urgently needed.

### Energy

The judgment concerning the necessary measures for assuring the thermal quality of future construction developments must then be based upon which quantities and types of energy are available during the period of use. As a result of the long period of use, e.g. an apartment building, it is certainly not logical to wish to design the building during its erection for the speculated external conditions in the next 100 years. In order to assure for all types of buildings thermal quality over the whole useful life, the need to classify more strictly under present aspects energy-economical measures is required.

Energy economy is exceptionally complex and regarding apartment and business buildings it extends from town planning to technical building equipment. These relationships must be considered in the case of future developments in the

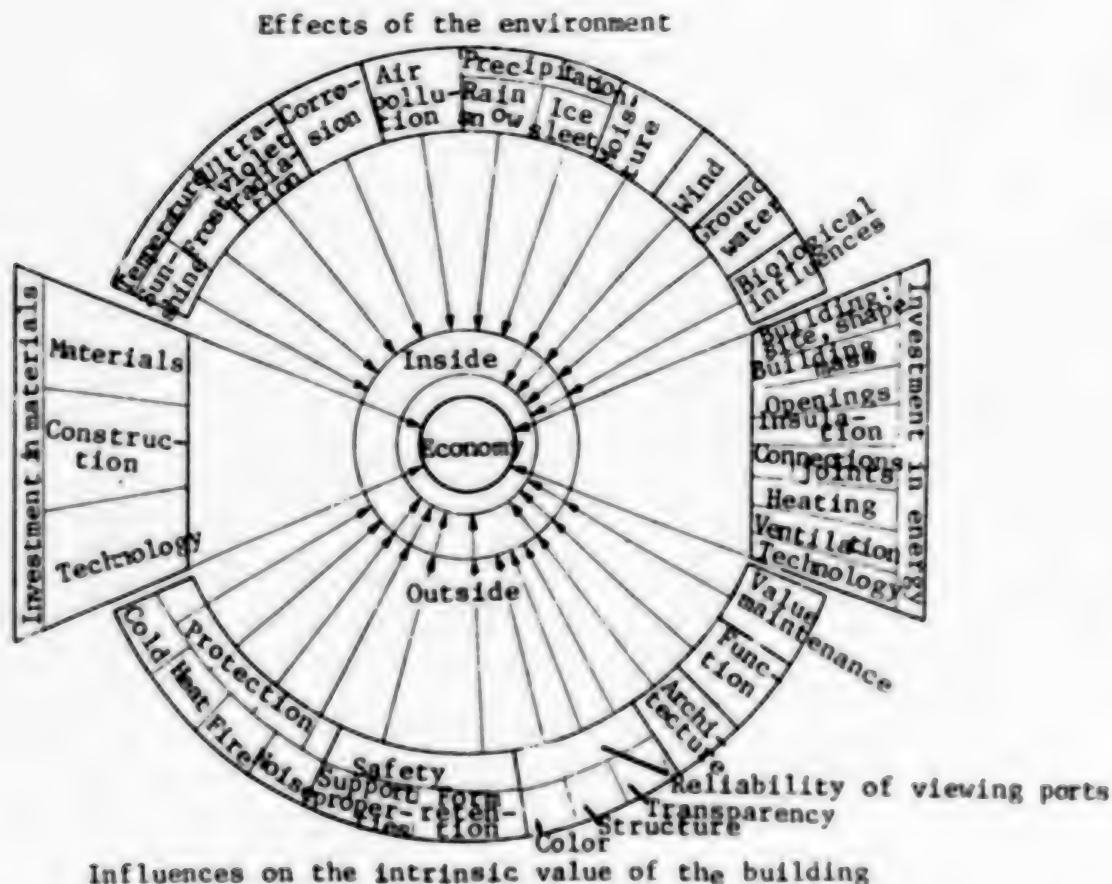


Figure 1. Relationship of Materials-Energy-Environment-Quality

building shell with greater responsibility. Such a dedicated timely economic classification of complex energy-economic measures permits the guaranteeing of the requirements for the assurance of the thermal quality, e.g., of newly constructed apartments under all circumstances over the whole period of use with a minimum investment for the time being. In this case the following should be discussed:

--Energy-economy factors of living area and building that are no longer technically and economically variable after the erection of the building, e.g.:

- building site
- number of floors
- building compactness (surface-volume ratio).

With the goal of reducing energy consumption in the case of new apartment construction these measures must be in effect. If this is not carried out, the possible effects in this case are lost forever. The consideration of energy in the factors cited requires in general no increased one-time investments; many times even the one-time investment in this case drops parallel to the city planning-architectural advantages.



--Energy-economy factors of living area and building that are still variable after the erection of the building but require relatively high investments, e.g.:

--the later shutting of construction gaps or open gable ends, respectively, to closed corners

--the later improvement of the insulation at the building surfaces (darkfield)

--the later fundamental change in the heating system, e.g., from individual heating units to central heating.

Energy-economy measures of this type should be resolved during the new apartment construction right from the start as much as possible so that later alterations are not necessary.

--Energy-economy factors of living area and building that are variable also after the erection of the building with economically acceptable investment, in particular then when the alterations coincide with the time for the replacement of building parts and equipment. Among these would be the following, for example:

--later installation of windows with further improved insulating quality at the time for replacement of the old window frames

--later installation of improved technical building equipment, especially at the time for replacement

--later equipping of the apartment house with a system for the utilization of waste heat and environmental heat, which at present are not yet viewed as economical and for which at this time also no suitable production line exists. In this case too consideration of the times for replacement or repairs, respectively, e.g. of the roofing, of the front wall surface, or the ventilating system, has a reducing effect on the heating costs.

Energy-economy measures of this type must not be provided during new apartment construction as long as the required thermal quality can be assured for a foreseeable portion of the total lifetime of the building by other solutions with a lower investment. Of course, the thought of the later technical building equipping should receive consideration right from the beginning so that certain prior conditions for it are not "excluded through construction." A general priority and sequence of energy-economy measures in apartment construction could thus be expressed in the following manner:

1. Reducing the heat demand of a dwelling by limiting heat loss through transmission and convection. Considered complex, the reduction of the building surface generally also belongs to the development of the outer wall including windows and ventilation which indeed is fixed above all by the architectural design.

2. Reduction of the amount of heat introduced into a dwelling to the necessary level (also measured as the primary energy demand) through new solutions of the TGA [Technical Building Equipment]. In contrast to the insulation, significantly higher investments in energy savings are necessary here.

3. Where possible, reduction of the amount of heat fed into a dwelling from the public energy network through installations for the use of alternative energy sources (waste and environmental heat) in the apartment building itself or in an apartment complex. Here the greatest investments are required. At present it still be said that measures of this type, including, for example, solar collectors, heat pumps, and energy recovery equipment, cannot be installed everywhere at this time in the mass apartment construction in the GDR. Nevertheless, research and experiments should also be carried out in this direction. Logically such points of view also apply to other categories of buildings.

## Materials

Material investment is becoming everywhere a key problem qualitatively and quantitatively for the construction industry as one of the mass consumers. A significant role is played by the investment in steel in this connection, first of all in the countries that have steel at their disposal temporarily or longer but only to a limited extent. The level of steel consumption is influenced decisively by the objectives of the building politics of a country, derived from economic and social data, e.g. the relationship between new construction and maintenance, modernization, and reconstruction.

In no case may functional design be underestimated on the basis of the intrinsic values to be assured without fail or the use requirements, respectively. The realization of each functional solution requires materials equal to that type with which the function itself is not conclusively tied to one method of construction. A major area of materials economy also lies in the future in the mastering of the various material, construction, and technological possibilities of the structural conversion of a function relatively unchanged in its characteristics.

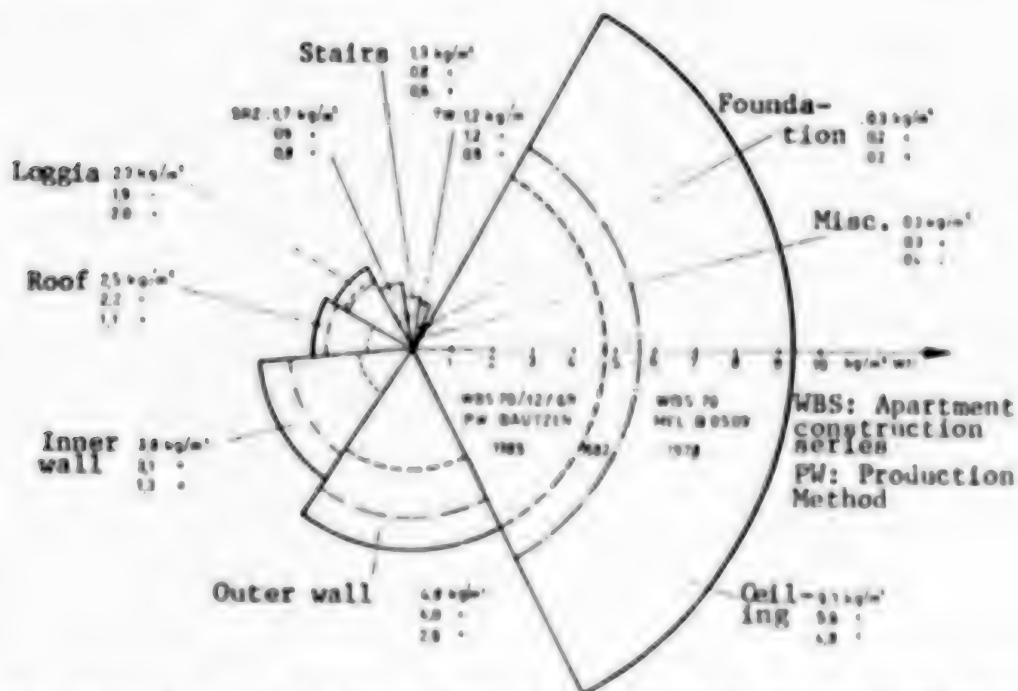


Figure 2. Reduction of the Investment in Reinforcing Steel in the Apartment Construction Series 70

Steel construction can be influenced by the following:

Suitable choice of the method of construction of the building and the construction materials associated with it;

2. Simplification of construction solutions used with economies at different levels down to the scientific-technical threshold;

3. Introduction of new construction-technological solutions that make an encroachment necessary into the present materials, construction, and technological data and lead practically to the innovation of the conditions of the building.

Recently the steel incorporated into large slab construction was successfully reduced significantly through progressive scientific-technical measures such as by simplification. Among other things, this is closely related to the abolition of cross reinforcement in the case of the WBS-70 apartment construction series prestressed concrete along with the introduction of the layered slab foundation and the use of ETV concrete. A detailed account was given on it. The lower limit is reached according to (2). Concrete--the main building material of our time--must be used more than before with greatest efficiency and quality. An important criterion of efficiency for a concrete since time immemorial is the addition of the minimum amount of cement whereby technically and economically optimum marginal conditions of construction and finishing are fulfilled and requirements that cannot be lowered regarding quality and the intrinsic value of the products must be guaranteed.

Even with the evaluation of all objective differences in building constructions and finishing conditions we have a high consumption in the slab factories.

The reduction of the cement use must be primarily based upon a very critical analysis of the products in order to make an objective comparison possible, to determine causes, and to derive attainable minimum values. A further materials-technological improvement in quality of the prefinishing whose measures are sufficiently well known, is necessary in order to become suitable for the high demands of the ETV concrete.

#### Quality

The demands on the reliability of outer shell constructions, outer wall and roof, are growing and along with those on the quality with its subjective and objective effects. Quality analyses indicate the importance of immediate measures but also show the need for concentrated research efforts in connection with the further and new development of the building shell constructions. With the turn to intensive construction unifying old and new we must come step by step to build with conservation in mind whose philosophy comes down to what we understand as reliability: namely in the sense of cybernetic systems theory the degree of susceptibility to interference of a system.

Reliability of the outer shell construction is an expression of the probability of the correct fulfillment of its functions under severe surrounding conditions, which are today much more complex and complicated than previously.

Building with conservation in mind with periodically differentiated use and optimum periodically delayed repair cycles in this connection becomes one of the economic tasks with highest priority. As is the case in machine construction, for example, deterioration mechanisms affect the deficiency rate over a period of time which is shown in the example of the so-called "bath-tub curve." If this apparent science is applied to the building shell, then early and incidental deficiencies are minimal for walls and traditional roofs built according to the old rules of construction, and later deficiencies are postponed to a great extent with the necessary, prompt maintenance and repairs.

Otherwise the situation with today's industrial building must be able to develop without generalizations. While the incidental deficiencies remain relatively few in the cases of examined constructions and processes, original deficiencies, e.g. in elements of the large slab construction, are still present in too high proportion which is too high. Apparently, based upon characteristic fracture forming substances, they develop right in the finishing process and shortly thereafter. Still hidden they lead to a drop in the deficiency rate, but then often significantly increase and speed up the later deficiencies. The causes mostly lie in the uncontrolled finishing with too little examination, whereby the weather protecting layer of the three-layered outer wall takes on a dominant position. If we must still watch how the phase of the later deficiencies is made evident, then indeed upon the basis of accumulating international experience doubt and with it dedicated preparation of suitable methods of restoration is to be expected. It is undisputable that regarding the early and late deficiencies along with the most extensive elimination of negative, subjective effects, complex scientific efforts with the goal of systematic prophylaxis and building for easy maintenance are required in order to approach the curve of traditional building.

It would be premature or not yet possible, respectively, to point to the usual assembled outer walls regarding their reliability, principles of construction, choice of materials, finishing, and maintenance. At this time the abundantly available analytical material must be critically evaluated, and on this basis the so-called wear research was begun. In this case we are dealing mainly with the uncovering and evaluation of the complicated chain of causes which would be hardly successful without comprehensive large-scale experiments simulating the actual relationships. With this the comprehensive partial data, that are already available among others for the mechanical and thermal characteristics, for the corrosion, for the building materials, for the machinery, must be included and considered in its complexities. The goal is to reach as quickly as possible new fundamental rules, which, in close connection with a well-qualified control, lead to a detectable minimizing and delay in the later deficiencies.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

#### MEASURES RECOMMENDED FOR IMPROVED USE OF BUILDING MATERIALS

East Berlin BAUZEITUNG in German Vol 39 No 7, Jul 85 pp 298-299

[Article by Prof Dr Alfred Bernt, Institute of Technology in Leipzig, Construction Engineering Section]

[Text] Reduction in the Consumption of Materials

During the past 30 years over the whole world as much raw materials were taken from the earth as were during the whole human history heretofore. This fact makes clear the magnitude of the necessary reduction in the consumption of these materials. This applies in particular to the construction industry which is a large-scale consumer of materials and energy. From the viewpoint of economics a great responsibility falls upon the construction engineer.

In the coming decades fundamental technological changes can be expected. The intensified adoption of technologies producing fewer waste products and the development of tightly closed production cycles become an urgent commandment. The limited availability of steel, synthetic materials, and other building materials reinforces the requirement for the recycling of used materials. In the future even gravel will no longer be available in the proper quantity and in the necessary quality. Accordingly, even now structural skeletons of buildings with regard to solutions in assembly technology and geometrical precision should be constructed in such a manner that after the demolition of the building structural features of reinforced concrete, e.g. slabs and transverse wall elements as well as supports and girders, can be used again. If this is not successful, then the danger exists that the construction industry will turn into a waster of materials. Of importance in this case is the maximum utilization of by-products and secondary raw materials including their refining.

In order to reduce the economic investment to a greater extent, we need a new generation of buildings founded upon the basis of the available materials technology. In the case of their development, constructive and technological solutions must be sought whereby new construction, maintenance, renovation, dismantling, as well as the recycling of building materials and building parts form a single operation. Our buildings at present do not meet base requirements.

The development of a new generation of buildings and building components should be based first of all on the analysis of available defects and deficiencies in

buildings and the determination of the symptoms of wear to be expected over a long period. With research into wear and aging, special attention must be given to aspects of theories on reliability.

At this time recognized weak points in industrially finished buildings are as follows:

- fissures in assembled outer walls of light and heavy density concrete,
- closed but unsealed and open joints,
- defective coverings and coatings on roofs and walls,
- worn out TGA [technical building equipment] installations (heating, ventilation, sanitary) such as
- defects in loggias and other building sections that are exposed directly to the effects of the environment.

With the further development of outer wall and roof constructions special emphasis must be given to the fact that later repair and renovation measures are possible on the basis of industrial processes. In this connection it is necessary to analyze the building components of outer wall and roof as their constructive and technological function, to superimpose them with the conditions of the reconstruction, and to derive the proper conclusions for new enclosing constructions.

Decisive factors for the development of new enclosing constructions are:

- improvement of the mass to performance ratio,
- utilization of the passive and active environmental heat yield,
- provision for the exchangeability of building components and building parts with limited durability,
- development of force held construction connections that are suitable for the ready dismantling of the building components.

Possibilities for the reduction of the materials investment among other things are:

- the expanded application of industrial monolithic construction methods,
- the further development of the construction method with finished parts in combination with the industrial monolithic construction,
- the stronger application of compound and connected constructions,
- the use of classifications of concrete with greater resistance to pressure,

- the expanded use of prestressed concrete,
- the more frequent use of tridimensional supporting structures,
- the use of plastic transverse and standard supports.

#### Reduction of Energy Consumption

The task is assigned to the building industry of the GDR of reducing the energy consumption by space heating by 40 percent.

The "environmental energy" which is based lately upon solar energy to be used in the future to a greater extent for space heating is not only a requirement, that is derived from the deficient availability and rising cost of crude energy resources, but is at the same time an urgently necessary endeavor on the part of the building industry to reduce the environmental pollution. As builders, we must in the future feel obligated to be more conscious of this need.

For the collection of environmental energy and its utilization, passive, active, and hybrid systems are available to us. While, in view of our climatic conditions, an economic utilization of active solar measures is controversial, in the opinion of the author the passive possibilities of solar energy utilization are given too little attention. The building climatic and building physical fundamentals needed for this are available. They are only to be used appropriately and to carry the project into practice. The passive use of solar energy is based exclusively upon the means of construction and in comparison with the active systems needs no mechanically equipped installation. In this case it deals with building according to climate. The most significant role is played by the window as solar collector. On the whole the window is to be viewed as a unit between the source of heat gain and the source of heat loss. For the planners this is a problem of optimization. Since with each windowpane the heat gain is reduced by about 10 percent, the use of triple glazed windows in the building wall facing the south must be questioned. Great heat energy savings can then be achieved with a southern orientation when double glazed windows are combined with movable installations that reduced the heat loss at night. With such windows with a southern exposure, that is windows with temporary heat insulation, with our climatic conditions heat energy savings of about 30 percent can be realized. The mobility required for the temporary heat retention measures is achieved by sliding, rolling, or folding. Installations of this type can be placed on the inside or outside and should form an additional, extensively sealed layer of air; they should consist of materials with slight heat conductance and possess a surface coating with a low emission rating. Temporary heat retention measures that at the same time act as an effective solar collector were installed so far unsuitably and insufficiently.

A good example in this area is the "Thermorello" (5). It increases the heat retentiveness of a thermal glass sliding window more than double during the evening and night hours. Although the window is able to perform as a solar collector in connection with temporary heat retention for an effective contribution to heat energy economy, a significant reduction of the energy consumption for space heating is then achieved only when at the same time the city



building, functional, constructive, as well as heating and ventilating possibilities available to us are used in a complex unit.

The city building possibilities are derived:

- from the decision on new construction or modernization, i.e., from the determination whether the energy in question is enjoyed or reused (50 tons of building material/unit of heat (kcal)),

- from the choice of the location and the distance between buildings with consideration of the slightest heat loss through wind velocities (the heat loss from increased winds can come to 30 percent; foliage in the open areas cuts the wind velocities),

- from the decision on the building shape and geometry with an eye on reducing heat demand, e.g.:

- waiving tall buildings
- enlarging the building depth
- limiting the freestanding gables
- use of business establishments located beside or underneath apartment houses, and

- from the orientation of the building toward the sky in view of the maximum heat gain from solar radiation.

Among the functional and constructive possibilities are

- the realization of staggered heat zones in the design,

- the utilization of the heat storage capacity of massive building components, in connection with windows as solar collectors,

- the improvement of the quality of heat technology in the outer wall and roof constructions, and

- the optimization of the layered construction of the enveloping constructions as a function of the requirements regarding the heat insulation and heat retention.

The heating and ventilation technical possibilities are provided:

- by the use of microcomputer regulated house supply centers that control the introduction of the heating medium depending upon the temperature and the wind velocity,

- by the use of interval heating and on demand,

- by the installation of heat recovery equipment for the exhaust air (40 to 70 percent of the heat from the departing air is usable),

--and by the use of radiating disks for the full and partial space heating of spacious buildings in industrial construction.

With the possibilities listed here in the future we shall be able to induce a significant drop in the energy demand for space heating. A condition is a complex, energy economy mentality, above all in the case of the development of a new generation of buildings. The success of our work will depend upon how architects, construction engineers, and building economists carry out their tasks with energy in mind.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

OUTER WALL THERMAL RETENTION INCREASED THROUGH AIR-POCKETS

East Berlin BAUZEITUNG in German Vol 39 No 7, Jul 85 pp 304-306

[Article by Dr Peter Bauer, Chamber of Technology, Institute of Technology  
Leipzig, Construction Engineering Section]

[Text] Determination of Economic Objectives

With regard to the economically required energy and materials conservation as well as material substitution and increase in export profitability is a requirement for the development of outer shell constructions with favorable mass-performance ratios. A possibility for this consists in the sensible use of the air of the medium. In the case of layer thicknesses  $>5$  mm the air is a poor conductor of heat and a "building material" available in unlimited amount. According to the desired objective either heat energy or materials can be conserved (the first cited objective should have first place).

--Through optimization of thermally effective air-pockets heat retention through construction technology can be improved without the additional use of insulating materials. This means that during the cold season the heat energy demand drops and in the warm season in the case of light outer shell construction the costs for ventilation and air-conditioning technology installations are reduced or it increases the thermal comfort of the room climate.

--If the objective lies in the direction of limited material investment (construction material), with constant heat energy demand thermal insulating material can be conserved.

An additional positive effect occurs with the arrangement of air-pockets through multilayered construction necessarily connected with it regarding the moisture proofing. The penetration of precipitation moisture into the outer wall is made difficult, condensation formation is either blocked or at least limited, and the drying out characteristics become more favorable. The result of all this is thus a better heat retention.

Outer walls with air-pockets can find use in industrial and business construction but also in dwelling construction. With the results of the investigations a contribution to the light, economical construction with domestic raw materials to the greatest extent for new construction as well as with the restoration and renovation of old buildings.

## Scientific-Technical Problem

The three components of heat transfer--heat conductance, convection, and heat radiation--are influenced significantly by air-pockets of certain geometry and the material of the surrounding the air-pockets. There is a series of publications on the convective heat transfer in air channels and pockets. They refer, however, to air channels or pockets, respectively, in a plane orthogonal to the heat current. The hollow spaces in this case are either fully closed or, however, open on two sides with a broad surface so that the convection is brought about mainly by wind.

The arrangement of several air-pockets one behind the other, whose surrounding surfaces partially reflecting and whose air-pockets are neither hermetically sealed nor developed as posterior ventilation, was so far hardly or not examined. Air-pockets in this arrangement and construction possess indeed advantages thermally and with regard to dampness.

The central point of the investigations is the thermal efficiency of ventilated and fully closed air-pockets with partially reflecting surrounding surfaces in the outer walls. In the results of the not yet concluded theoretical and experimental investigations with consideration of moisture protection the air medium is used approximately optimally under winter and summer conditions for the improvement of the architectural heat retention.

## Methodical Procedure

Since neither the necessary initial values for a calculation of the thermal efficiency of a number of air-pockets arranged one behind the other with separatory surfaces of various materials nor a practical basis for the calculation itself are known, the achievable effects were then derived experimentally with high priority. The experimental investigations carried out in the Engelsdorf Laboratory for Construction Physics were conducted during the cold season under quasistable conditions, i.e., natural external climate and constant room air temperature, and in the warm season under inconstant conditions with natural outdoors and room climates. The measurements under natural climatic conditions have the advantage of relevance to practice and provide data on the effects of meteorological values, such as wind and sunshine, on the relevant quantities of heat retention technology in the outer building components.

Because of changing external surrounding conditions--particularly in the warm season this occurs repeatedly with great frequency--the measurement and recording of a great number of data is unavoidable. Just with the measurements in the winter of 1983-84 for the calculation of the resistance to heat conduction about 15,000 individual values were used. On the average for each layer series studied about 300 individual heat conduction resistances had to be calculated. This large number of individual values and the good normal distribution of the individual data obtained from most of the experiments lead to the expectation of a reproducibility of the data.

In the case of quasistatic conditions from December to the beginning of March, a standard deviation of an average of  $\bar{s} = 0.064$  could be obtained. With



increasing sunshine intensity from mid-March to the beginning of April the standard deviation increased on the average to  $\bar{s} = 0.127$ . It should be noted, however, that apparently false single values from the effects of sunshine and from above average wind velocities were disregarded during the evaluation of the experimental series.

In order to obtain relevant data for the warm season, the measurement cycle was sextupled, and in fact to 144 cycles per day. Accordingly, even short-term meteorological changes and their effects on the external building portion surface can be caught. Since these fluctuations have varying effects according to intensity and duration on the course of the temperature on the internal building portion surface, the measurement series was screened. With the derivation of the temperature amplitude damping--more correctly: temperature amplitude ratio-- $\gamma = \xi_{0,e}/\xi_{0,i}$  (without units)--the actual phase shift is given consideration. The results of the mathematical treatment of the entering and leaving values for the derivation of the temperature amplitude ratio are results representative for each single experiment, which according to the meteorological conditions are comparable also with other experiments.

Under natural, thus conditions close to practice, realistic and also reproducible characteristic quantities can be derived insofar as in the median the climatic relationships present are given. This method of measurement forms a logical connecting link between the methods of the climate chamber and experimental building. It connects the advantages of the laboratory investigations on the one hand with those of the close to practice marginal conditions of the other methods.

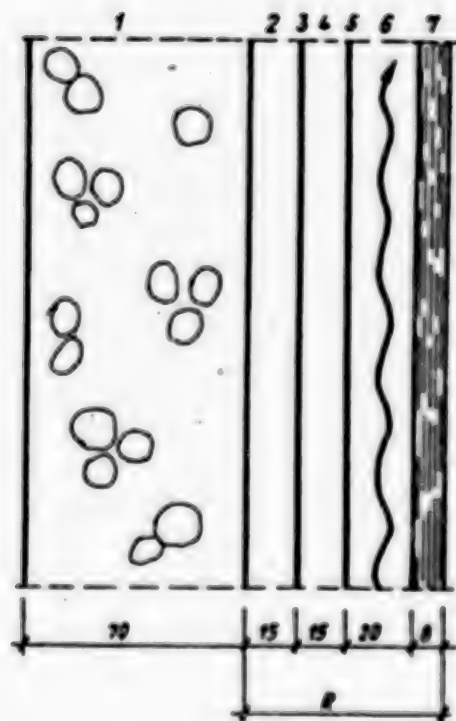
#### On the Efficiency of Air-Pockets for Architectural Heat Retention and Their Practical Application

In most of the cases of application a layer of heat insulation on the outside in contrast to the one inside offers greater advantages. In the case of full utilization of the thermal capacity of air-pockets heat insulating outer walls can be constructed without the use of commercial heat insulating materials. The principle series of layers is:

- 20-100 mm inner shell, solid
- 10-20 mm air layer not hermetically sealed
- 10-150  $\mu$ m radiation reflecting separatory layer
- 10-20 mm air layer not hermetically sealed
- 10-150  $\mu$ m radiation reflecting separatory layer
- 20-25 mm posterior ventilation
- 1-10 mm weather resistant outside surface

The picture shows an example of a layer series. Disregarding the self-supporting solid inner shell, only the two or three, respectively, air-pockets, the radiation reflecting separatory layers, and the resistances to heat conduction contribute significantly to heat insulation.

The three components of heat transfer are minimized in the following ways:



Layer series in an experimental wall:

1. light concrete
2. air layer not hermetically sealed
3. aluminum vapor plated foil
4. air layer not hermetically sealed
5. aluminum vapor plated foil
6. posterior ventilation
7. asbestos cement shingle

#### Heat conduction

Through the separation of the individual layers of materials the heat conduction, which is typical particularly for solid materials, is severely limited. The heat conductance of resting air according to Haeufgloeckner (1) comes to  $\lambda = 0.023 \text{ W(m}\cdot\text{K)}$ . Since air in a pocket cannot be kept at rest, the heat insulating properties of an air-pocket does not increase with thickness in a straight line curve.

#### Convection

As a result of the temperature difference between the two surfaces touching the air-pocket, the air is set into motion (not only thermal updraft). In the case of relatively thin air layers with smooth touching surfaces, the air current is mainly vertical and with small velocity. The less the ventilation of an air pocket, the less the heat conduction. Hermetically sealed air-pockets show the least convection since no exchange of air with the environment is possible.

In the literature a thickness of sealed air-pockets of 40 mm to 60 mm is reported to be the thermal optimum. Between 0 and about 15 mm a strong rise in the resistance to heat penetration can be found; above that still only a very little. In our own measurements this could be determined also for air-pockets not hermetically sealed. In order to achieve a good volume-performance ratio and on the other hand to prevent touching the bordering surfaces, air-pockets in outer walls (new construction) should preferably be 15 mm to 20 mm.

Since it must be assumed that in outside walls hermetically sealed air spaces can hardly be built, the formation of condensation moisture must be avoided through regulated air movements. An increased convection is connected with this intended, slight ventilation, which, however, with the suitable choice of openings has almost no effect on the resistance to heat penetration. In the case of an air-pocket completely open at the bottom about 85 percent of the heat insulating properties of the air space are still retained. If the air space is open at the top and bottom to about 10 percent of its cross section, the reduction of the insulation value in comparison with the hermetically sealed air pocket is so small that it could not be determined under quasi-fixed conditions. A number of experiments proved that openings placed above and below comin. to 10 percent of the air space cross section with an inner wall of 7° mm light concrete and in a flat land climate was sufficient to achieve an elimination of condensed moisture on the surrounding surfaces.

Table 1. Resistance to Heat Conduction (R) and Heat Insulation Equivalents for Air Space Series (provisional results)

Air layer series	R m <sup>2</sup> ·K/W	Insulating equivalent	
		Polystyrene mm	HWL shingle mm
AP/Al dep. PVC-H foil/PV	0.4	15	35
AP/Al dep. Polyester foil/PV	0.55	23	>35 (45)
AP/Al dep. PVC-H foil/ AP/Al dep. PVC/H foil/PV	0.7	28	25 + 35
AP/Al dep. Polyester foil/AP/Al dep. Polyester foil/PV	0.9	37	25 + 50
AP/Al foil/AP/Al foil/PV	≈ 1.0	40	75 (pd = 250)

AP = air pocket

Al dep. = vapor deposited aluminum

PV = posterior ventilation

#### Heat Radiation

A portion of the heat given off by a part of a building is always emitted as radiant energy, that when in contact with another solid is converted once again into heat. If the surface of this material is strongly reflecting, this material absorbs only a little energy and as a result also warms up only a little. The reflected radiant energy returns to the part of the building and is absorbed in the form of heat energy. This means that the greater the reflectivity of this "radiation shield" and thus the smaller the emission

capacity is, the smaller the current of heat through the whole building component. A particularly low rate of emission ( $\epsilon$ ) is provided by glossy aluminum surfaces, such as for example, aluminum foil. The reflection from polyester film with vapor deposited aluminum is only insignificantly worse. Other carriers with vapor deposited aluminum, e.g., PVC-H foil or paper, provide a clearly worse emissions capacity based upon their significantly rougher surface.

Since the aluminum surface loses some of its reflecting capacity through oxidation and impurities in the air, it is recommended in the case of outer walls without heat insulation that two reflecting foils be set up.

From experimental investigations over a 3-year period which were carried out on outer-walls consisting of a 70 mm light concrete inner wall, an "air-pocket series," and a weather resistant shell of asbestos cement or glass shingles, the resistance to heat conduction (R) shown in Table 1 could be calculated for the "air-pocket series" (without light concrete). Furthermore, the table reports the layer thickness for two heat insulating materials that correspond to the "air-pocket series" in the resistance to heat conduction.

The layer series of an experimental wall shown in Figure 1 can be modified for practical application to new construction through the replacement of the light concrete with a thin shell of high density concrete. At present in cooperation with the VEB Metal Light Construction Combine preparations of a prototype of an industrial gate with air-pockets are being made.

Outer walls of old buildings, whose weather proofing and heat retention are no longer sufficiently provided, can be restored with the aid of previously prepared, hand installed "air-pocketed, weather proofing components." Even with just one foil the heat insulation of a one-and-one-half thick stone, brick outer wall is doubled. If the wall is still moist--this is very often the case with deteriorating plaster walls--the existing heat insulation can even be tripled with one foil since the "air-pocket construction" favors a drying out of the brick wall.

Remarks: This article is the result of collective research efforts to which Dr L. Hanke and Dipl.-Ing H. Wollny contributed.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

REFINING OF RAW MATERIALS, LIGNITE PRESENT ECONOMIC PROBLEMS

East Berlin WIRTSCHAFTSWISSENSCHAFT in German Vol 33 No 6, Jun 85 pp 883-90

[Article by Gerd Schirmer]

[Text] Higher refinement of raw materials and energy resources plays a central role in the transition to comprehensive intensification. This is why that topic was the subject of a conference of the GDR Academy of Sciences' (AdW) Scientific Council for Theoretical and Practical Issues of Energy and Material Economics, which convened in the Freiberg Energy Institute in September 1984.

In his introductory remarks, Professor Heinrichs, chairman of the Scientific Council, underlined the great importance of the conference topic for accomplishing our economic strategy. It is, therefore, particularly important for representatives of the natural, technical and economic sciences as well as economic experts to discuss related theoretical and practical problems and contribute to their interdisciplinary solution. Utilization of lignite as a domestic raw material determines how and through what social efforts the energy and raw material basis can be safeguarded. This raises both practical and theoretical economic questions that are of general importance for strengthening the intensively expanded replacement of capital investment.

In his speech before the Economic Conference of the Karl Marx Year and during the consultations of the SED Central Committee with the general managers of the combines in March 1984, Guenther Mittag noted the importance of production refinement for our strategy and outlined a basic orientation for the council's activities.

Starting with the results, specifically obtained for the 35th anniversary of our republic, Professor Bachmann (Mining Academy Freiberg) laid out the theoretical and practical tasks that are central to any interdisciplinary and disciplinary work for the transition to comprehensive intensification. As stated at the 7th and 8th meeting of the SED Central Committee, greater progress must be made in energy resources and raw materials refining so that greater efficiency can be achieved through new products and new technologies. Past experience indicates that refining measures must be put into operation faster and on a broader economic basis.

Higher refinement must be considered a special labor process, he said. While quantitatively, higher refinement leads to greater performance and thus to comprehensive satisfaction of existing needs at the same level, qualitatively, it increases the use value, which makes it possible to better meet new or existing needs. By adding qualified human labor, higher refinement will contribute to human

and concretized labor savings. The refinement of various raw materials depends on the material and on the technology as well as on the specific work effort and the produced use value, or on its production conditions and the impact of its economic application, respectively. "Normally, increased use value in coal refinement does not lead to innovative products; coal refinement is primarily substitutive in character in that it physically replaces gaseous and liquid raw materials whose acquisition is tied to large import expenditures. In the case of basic raw materials, the economic cost advantage must be obtained by capital- and energy-intensive processing steps, so that based on today's knowledge, we can expect neither an absolute nor a relative improvement in the intensity of our capital investment fund."

The technical and use value covers a number of steps in the refinement of lignite, which causally are related, both in terms of technology and material-energy, and which have different operational and economic effects. In addition to focusing on the highest refinement level, the lower levels must also be taken into account under the prevailing conditions, especially if the requirements of the economy, the time factor and a short return-flow time of the expenditures warrant it. In efforts to determine the socially required labor for carrying out the individual steps on the basis of technological data, "scientific-technical and economic thinking meet early and provide concrete points of departure for the interdisciplinary work of engineers and economists."

Higher refinement creates new problems with regard to the recycling of waste materials into secondary raw materials. The greater the level of refinement, the more does the final or intermediate product--and thus the waste material--differ from the original material. It is economically desirable to recycle waste in the form it is available, since use in any other production form requires additional effort. This poses new requirements for the recycling technology.

"Refinement, which in every instance must be associated with a lower energy, raw material and equipment production intensity, means less energy and materials per unit of use value unit. However, one can only speak of a higher refinement if the use value produced from a raw material by way of science and technology, combined with complex processes, is greater than that of the use value of the product previously produced from the same material. This must be the determining path of the future. In this connection, it is useful to analyze the connection between higher refinement and the dynamics of production consumption and to justify the resulting decisions both from the standpoint of the product and the process. This is necessary because the different conditions in the extractive, processing and manufacturing industries require different judgments in terms of the higher refinement. "From the point of view of use value, the essence of higher refinement consists of the productive utilization of new scientific-technical findings, of newly developed or more advanced products and methods. As a result of exceptional power to produce ... their productive, economically efficient utilization must lead to widespread and intense economic application, by putting them into production fast and above all by distributing them fast." Here again, one must start from the

specific capital replacement requirements of the individual branches and sectors. Hence, basic product innovations in the raw materials producing sectors are of secondary importance.

The best results for economic efficiency and the production structure are derived from the refinement of raw material processing and the transformation of primary energy. It permits the manufacturing industry to reduce the raw material, energy and capital intensity of its production processes and to contribute to meeting domestic and export needs in a better way through new products and higher use values. In terms of raw material producing industries, it contributes to resource-saving capital investments.

Refinement of raw material processing and energy transformation take the form of new or improved materials and energy sources and provides the strongest technical impulses for higher refinement in the manufacturing industries. Thus, in the raw materials processing enterprises, "a variety of scientific and technological efforts are required to compensate for a refinement deficit, so-to-speak, that is the result of less favorable natural conditions, especially in terms of the quality of domestic raw materials in comparison to that of imported raw materials and energy resources. Refinements achieved so far, which match the world-wide level as far as product quality is concerned and which lend themselves for export, must be valued that much higher."

In order to evaluate higher refinement, criteria and characteristics are required. "Basically the degree of refinement can be determined by comparing the use value of a product with the cost required in terms of raw materials, energy, and equipments. This general formulation for specifying the degree of refinement should be reflected in all forms of refinement indices that are applied on the basis of specific conditions. For comparison and planning purposes, the refinement degree must be expressed in the value. By doing so, the measurable orientation towards higher use values is lost, but since the use value is a factor in setting prices and corresponds to the price, a representation based on value in the numerator of the degree of refinement is justified and even necessary for planning and accounting purposes."

If the raw material, energy and material consumption is measured in terms of the net product, the degree of refinement expresses most clearly the larger use of skilled human labor in its use-value and value-forming potential, which expresses at the same time the proportion the new value represents of the total production value. The net product shows the result of higher refinement more clearly than the other production results. In exports, the decisive criterion for refinement is the net foreign-exchange earnings. For specific products of the manufacturing industry, the price per kilo has a similar function. Here, differences in world-wide levels and development cycles can be shown particularly well.

Further economic research should focus on studying the economic aspects of higher refinement as related to the theory of value. "It is widely assumed that, in every instance, higher refinement must lead, on a societal

level, to the creation of additional new value. Obviously, value dynamics and reference quantities are not given sufficient consideration in that the creation of additional value through refining can only refer to a concrete product in contrast to those producers who do not (yet) do any refining during the same production and realization period ." During the subsequent production phase, the additional new value disappears in the now lower product value. In connection with higher refinement, there is always talk of skilled labor; this refers primarily to the skill level of the producer. As concrete labor, skilled labor increases the use value per unit of energy, raw material or equipment. As abstract--value creating--labor, more skilled or complex labor is, according to Marx "exponentialized, or rather multiplied, simple labor ," i.e., labor of "exceptional productive force ." In refining, skilled labor means more complex labor.

Another problem discussed was to examine the relationships between producer and user utility and the related question of price formation for refined products. "In many instances, the refinement of raw materials does not become effective in terms of use value, cost reduction and increased profit until it reaches the user. User utility is often a multiple of what the producer has earned from higher refinement in terms of income and increased profits. This raises the question of how industry and the enterprise set the prices of more highly refined products ." After all, the question is to also permit the producer to benefit from the high user utility and to reflect it in larger measure in the price of refined goods.

The discussants talked about both the basic issues of refinement and focal points of refining lignite.

Professor Krug of the Freiberg Mining Academy addressed in his paper the mechanical-thermal refinement of lignite, lignite briquetting, which is the first of several technological steps of the current refinement process. Since it is no longer possible to make a significant improvement in the quality characteristics through high temperature carbonization, new ways have to be found to achieve a higher refinement of our lignite deposits. Account should be taken here of the fact that the quality of raw lignite and its change have a decisive effect on technology. A briquette is needed which is suitable for pyrolysis. This pyrolytic briquette is an essential prerequisite for both the liquefaction and gasification of lignites as well as for the manufacture of a high-strength BHT (lignite high temperature) coke that is used in metallurgy. The technological characteristics and their economic use were discussed on the basis of a number of research results.

Professor Klose of the Freiberg Mining Academy spoke on the value in terms of energy and savings of coal refinement methods, the end products of which are always energy sources with a high degree of utility and/or materially useful products. "The development of new methods for coal refinement or the intensification of existing technologies must be assessed from the standpoint of energy and economics ." Here, it's a matter of evaluating different methods with a view to making possible improvements, and of their



comparability. A comparison is meaningful only when the target products are comparable, i.e., when they are substitutable. For a technical evaluation of the methods, the degree of energy efficiency is suitable. For economic evaluations and comparisons, the whole energy cycle, beginning with producing the primary energy source up to the application of the energy must be considered.

To perfect existing and to develop new methods, high effects of quality and quantity of products, and of energy and economics must be achieved and the working conditions in these plants must be improved. Of decisive importance is also the environmental impact of the processes, especially since proven methods and those that must be newly developed are going to play a role well beyond the turn of the century.

In order to reach comparable conclusions on the economics of coal refinement, the following relationships must be taken into account: 1. Is there a relationship between the degree of refinement and the economic cost; 2. Can the degree of refinement be expressed by the degree of energy efficiency, which is a function of the primary energy resources used; 3. Are the costs--related to one unit of primary energy--not a function of the degree of energy efficiency; 4. Are the costs of the used energy a function of energy efficiency; and 5. Are there indications that, with the same input and product goal, the costs are almost independent of the process used. To qualify these evaluation measurements, their extension and improvement is necessary and should be a topic for interdisciplinary research by engineers and economists.

Professor Teubel of the Freiberg Mining Academy addressed the economic importance of liquid products of coal refinement. In view of the lack of liquid hydrocarbons, and in view of the fact that the volume of crude oil is stagnating in the medium-term and stagnating and decreasing in the long-term, it is important for the GDR to ascertain how the increasing demand for fuel and chemical products can be met from raw lignite. The speaker came to the following main economic conclusions:

- To use the most crucial mineral oil products, fuels, and organic materials in a meaningful way, to save them and to use them rationally;
- To change the processing structure of crude oil, especially through deeper fractionation. In this area, the GDR already has reached a level that is remarkable internationally. However, these sources are being depleted and this is why lignite refinement is of great importance;
- To use the by-products and related products of raw lignite refinement as crude oil equivalents;
- To produce fuels from lignite. Direct liquefaction is the shortest, but technically most difficult, and economically most costly method. Old, well-known methods for direct liquefaction are today, and will continue to be in the future, no longer useful. The issue for scientific technological development is, among other things, to increase the

flexibility in the use of raw lignite considerably and, since a qualitative selection is no longer possible, to gain a basic knowledge on sequential chemical processes.

This strategy of refining requires the assured availability of lignites. Although an increase in their extraction has been planned, lignites needed for refinement must come from energy savings.

These complex questions were also discussed by Dipl. Ing. Kroll of the Freiberg Fuel Institute. He said that research should primarily focus on developing and transferring new lignite refining methods, on expanding the primary energy base by including saliniferous lignite, on rationalizing traditional methods, and on ensuring high product quality despite the fact that conditions are getting worse. Our main efforts must be directed towards methods permitting the economic, material, and energy use of lignites. Among them, pressurized coal dust gasification is the most important, but also most difficult task to solve.

Dipl. Ing. Schwerdt of the Ministry for Chemical Industry spoke on developing the use of fossil coal resources as chemical raw materials. Consistent, more intensive decomposition could cut crude oil imports, while satisfying at the same time the higher demand for fuels. However, this would require considerable investments. Intensified crude oil decomposition is the most economical way today. In the medium term, this will meet the increasing demand for chemical raw materials and fuels and for heating oil that is needed for technological processes. The main road towards satisfying the long-term needs for chemical raw materials and fuels is to refine our domestic lignite by gasification and liquefaction. In this, the declining quality of the coal must be taken into account, which continues to require considerable research. This path requires both one-time and continuing expenditures.

Selected problems in refining chemical products were discussed by Dr. Fiedler of the Chemical Advisory Office in Halle. He stressed that refinement on an economy-wide scale must lead to a better output/input ratio. "This, however, is not the case when base chemicals bring higher profits when exported than highly refined products. This shows that antiquated, material- and energy wasting technologies, when used for higher refinement, may diminish returns, if compared with the export of basic chemicals. For that reason, the demand for higher refinement must not be accepted at any price, i.e., at any cost, but must be carried out with methods which correspond to the international technological level. Consideration of the foreign-exchange advantages of refined products can serve as an indication of the benefit of refinement." Detailed research must clarify those steps in the refinement process in which existing technologies provide great economic benefits and those requiring technological changes in order to obtain high benefits.

Professor Binting of the GDR Academy of Sciences' Institute for Chemical Technology addressed the problems of carbo-chemical refining. Here, refinement projects often mean considerable expenditures for large-scale

research and production. In many instances, it is possible to obtain identical end- or intermediate products by using different methods. He said, a special problem is that the economic optimization of each refinement phase requires that the whole production process must be evaluated on an economic, ecological and social basis. It must range from extracting the raw material from nature to consuming the material or using the economic end-product, including recycling waste materials from consumption back to production or nature. A central point here is to report, record and analyze the utility to the user. For refinement processes in carbon chemistry, the costs of protecting the environment must be considered as part of the socially required labor effort.

Dr. Herrmann of the GDR Academy of Sciences' Central Institute for Nuclear Research emphasized in his paper 3 main directions for coal refinement, which overlap in terms of time: modernization and intensification of classic refinement methods and equipment, complex use of harmful substances and coke-oven byproducts in making energy out of lignite, and development of refinement methods for lignites which cannot yet be used economically today. An effective strategy for refining lignite is only possible if treated as part of the complex energy and raw materials strategy.

Dr. Scharf of the Freital High-Quality Steel Works talked about refinement metallurgy. It involves a long-term program that requires considerable technological changes and investment and aims at ensuring the supply of the economy with high-grade steel, while maintaining, or even reducing, the consumption of material and energy. Among the specific tasks are:

1. To increase the use-value characteristics of products by manufacturing ultra-pure steels in the electron-ray multi-chamber oven, and to continue the development of plasma metallurgy;
2. To increase the degree of product packaging in order to save steps during subsequent processing;
3. To produce steels with very specific properties for material-saving processes;
4. To introduce material-saving technologies and methods to reclaim as completely as possible alloy components from scrap and to obtain considerably greater savings in the production and use of steel;
5. To introduce energy efficient procedures to reduce the extremely high intensity of energy.

By utilizing secondary energy, energy sources should only be used for metallurgic processes and for providing heat to the area.

Economic policy questions of refinement were discussed by Professor Wolf of the Freiberg Mining Academy and Dr. Buechner of the SED Central Committee's Academy for Social Sciences. Wolf talked about the interrelationship of higher refinement, complex labor, and the creation of new value. He spoke of the impact of skilled or complex labor on the creation of new value in the economy, the creation of new value per unit of time and of the magnitude of new value per product. The first and most important aspect here is "that in the Marxian labor value theory, the magnitude of the value is always an average figure". Since more skilled labor tends to be used for the higher refinement processes than for traditional processes of the same kind, the question arises, "what is the role of skilled labor in determining value?"

1. In " a given society (in which) more skilled than simple average labor is used in the various production processes for higher refinement... more abstract labor is expended per unit of time and hence greater new value is created in these processes ".
2. Simple " average labor, which determines the creation and magnitude of value, is not a constant, but a variable magnitude, which depends on scientific-technical progress and its application to production ".
3. It is not possible for the new value to increase overall in the economy as a result of higher refinement, if the number of productive workers and time worked per year remain constant.
4. With the trend towards increased social labor productivity, the new value per product unit is declining because less abstract labor is being applied.

These are all questions that have to be looked into in order to better understand the theoretical relationships.

Dr. Buechner concluded that it is primarily deep-rooted changes in the work objects that force their refinement. Thus, refinement is an important efficiency criterion of material production, which covers all economic effects associated with processing work objects.

While the " degree of refinement " reflects the " economic efficiency of the labor objects, the efficiency of the refinement must be determined in light of the total effort in terms of human and concretized labor expended for the refinement ". Therefore, a distinction must be made between these two magnitudes. From the viewpoint of efficiency development, the speaker saw 2 basic tasks for increased refinement: 1. To ensure that each refinement measure is of high economic use; in particular, it must have greater utility for the user and 2. To increase the economic effectiveness of higher refinement, primarily by modernizing and reconstructing the existing production potential.

In his speech, the representative of the Minister for Coal and Energy, Hildebrandt, commented on the tasks and main directions of developing the GDR energy economy. Two goals are paramount for providing the energy resources required for economic development: to combine meeting the energy requirements of the economy with measures to lower the consumption of specific energy and to provide energy with a minimum labor effort. All sectors of society must do their share to minimize the consumption of energy by consuming energy in an economic way. Most important are, in particular, continued efforts to improve the efficiency of primary energy resources, the utilization of secondary energy, reduction of losses during energy transmission, and energy savings in energy-intensive processes. Increased utilization of raw lignite and its higher refinement, reduction in the consumption of specific fuel heat in electrical energy generation, and the reduction of the internal consumption by power stations are important measures for these purposes. All these efforts are based on the effective



utilization of domestic lignite, which must be produced in larger quantities. Besides applying existing technologies to the rational utilization of lignite, a central point is to refine it through gasification and liquefaction. This is an important basis for using raw lignite for material-economic purposes and, by doing so, for increasing the supply basis for energy and raw materials overall. Simultaneously, expansion of the nuclear energy base will be accelerated so as to further expand its share of the electrical energy production.

Special emphasis is on the rational use of energy. Energy savings reduce the need for capacity increases and hence for capital investments. To exploit and make use of new savings potentials in all social sectors is an unprecedented challenge for science and technology.

In his concluding remarks, Heinrichs underlined the economic importance of refinement and pointed out that this interdisciplinary exchange of ideas had clearly confirmed the interdisciplinary character of this task. It is the result of refinement itself, which is a complex technical-economic goal that is intertwined with all areas of the economic capital replacement process. Each discipline must make creative contributions, which then lead to economic proposals. The economic evaluation of refinement as an economic task is a central focus for future interdisciplinary socio-economic work. In this context, refinement must be viewed as a social process. It is only meaningful if it improves in a noticeable way the ratio of user utility and production effort. To make this user utility part of the evaluation presents our natural-science, technological and economic research with new tasks and requires that the management, planning and incentive system be included in the analysis. Another important factor of refinement is the fact that the better utilization of raw materials expands their supply. This, in turn, is linked to the whole spectrum of social labor efforts for using specific raw materials more rationally and the possible expansion of targets. The technical and economic evaluation of resources and their refinement must help to find new potential savings as a source of growth.

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ECONOMY

POLAND

#### READERS PROTEST HIGHER CAR TARIFFS

Warsaw POLITYKA in Polish No 35, 31 Aug 85 p 4

[Letters to Editor by Stanislaw Tuzynski and Andrzej Ziemilski]

[Text] The increase in customs duties for imported cars is a clear admission of preference for Polish emigre firms selling used or casual vehicles on the Polish market, vehicles which in the Federal Republic of Germany would either be scrapped or sold for no more than half the price asked for in deutschmarks in Poland. It doesn't take too much imagination to come to the conclusion that Polimar and similar firms have gone to great trouble to bring about this new change in the customs duties.

It is difficult to see any advantage here for the state, which, if it really wanted to stop the flow of hard currency to the West to privately buy cheap used or new tax-free cars, would simply have authorized internal export through PKO-Polmo-Behamot, but above all would have increased the selection of cars offered for hard currency, improved customer service, and would have made it possible to buy spare parts through authorized services (present rules make it virtually impossible for privately operated stations serving western-make cars to obtain spare parts, while PZMot stores, which can obtain them, are unable to satisfy demand in that respect.)

The increase in customs duties will have no significance for the public in general, since those who have hard currency and want to buy a car, regardless of the poor selection at Polmo-Behamot, will spend that currency at Polimar, often for a beat up old jalopy put together from junked parts, thereby increasing the number of old, non-standard cars on the Polish market.

The higher duties on cars are also not of a protectionist nature, as is well known, those who have hard currency buy almost exclusively cars with high-power motors, which the Polish automobile industry still does not produce and will not produce for some time to come. But it is difficult to speak of significance for the public of higher duties when the new rates will equal 10 or 15 years wages for the average Pole! And it should be borne in mind that most of the people who buy cars for hard currency, in spite of appearances, are not speculators, but rather average workers, civil engineers, welders, doctors, bricklayers, seamen and others sent abroad on foreign contracts who pay a

high percentage of their foreign currency earnings to the foreign trade organization which sent them abroad and who, due to the impossibility of buying a better apartment, for example, mark their material progress by buying a car.

The higher duties on automobile parts will have two consequences: 1) they will hinder the dieselization of private cars, thus working against a reduction in the demand for gasoline; 2) they will mean that foreign-made cars will be repaired with non-standard or home-made parts, which will mean that they will wear out faster, and thus society as a whole will be the poorer, and also, to a considerable extent safety on the roads will be diminished.

Both of these effects are in absolute contradiction to the economic interests of the state.

The only one to benefit will be the foreign firm importing high-power motors to Poland, or one selling spare parts.

As for the increase in duties on imported electronic equipment, what we have here is another case of throwing the proverbial baby out with the bath.

The most effective barrier, which on the one hand would discourage the "tourist" trade, and on the other hand make it possible for the more prosperous people to buy for their own use those technical achievements which have long been taken for granted in the West, would be to keep the customs duties at their present levels for the first piece of equipment while increasing the duties by several hundred percent for each succeeding piece. Also Pewex and Baltona should offer a broad selection of up-to-date video-cassette players, radio-tape-recorders, etc., at competitive prices, or at least at prices which would approach western tax free prices. Hitherto, prices at Pewex and Baltona, aside from the total lack of selection, have been from 60 to 90 percent higher than in the West.

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In a conversation with representatives of the trade unions it was affirmed that the government will do everything it can to assure that inflation does not surpass the 6.6 percent provided for in the plan. The latest increase in customs duties for imported cars and spare parts amount to approx. 120 percent. Will that really not influence the increase in the costs of transport (e.g. of food from the countryside to the cities in farmers' private cars) more than the amount provided for in the plan? Not to mention the psychological effects of yet another barrier to people's aspirations and changes of realizing them in this life?

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#### PLANNING COMMISSION REVIEWS MACHINE TOOL INDUSTRY

Warsaw RZECZPOSPOLITA in Polish 4 Sep 85 pp 1,2

[Text] A meeting of the Presidium of the Planning Commission of the Council of Ministers which took place on 3 September was devoted to development programs for the machine tool industry and for more efficient use of supplies of material and of fuel and energy for the period 1986-90. These programs will determine whether the tasks of modernizing the economy and consolidating the bases of its balanced and efficient development are fulfilled.

As the information presented at the meeting shows, the 350,000 machine tools in the economy are becoming obsolete. This is accompanied by the declining ability of domestic production to meet demand in this area. Under these circumstances, as was emphasized by Vice-Premier Manfred Gorywoda, president of the Planning Commission, in the coming years it will be necessary to considerably speed up the development of this "industry of industries" as a matter of the greatest priority. A tremendous increase in machine tool production, especially those of the "higher generation", which represent the technical means of production for the machine industry as a whole, is one of the basic ways of increasing the material efficiency of production. Modernization of the machine tool park is also a major source of increased labor productivity and a way to compensating for the labor shortage.

During the discussion the need was emphasized for ensuring the essential conditions for fulfilling the machine tool industry development program which was presented.

Exports were recognized as the main way to break down the barrier of technical supply, which will provide the funds necessary for essential import purchases. Increased exports, backed by specialized and cooperative agreements with the USSR and other CEMA countries, are an additional way to better meet the needs of the economy for machines and equipment not produced in Poland, and to improve our trade balance. The need to coordinate the machine tool industry development program with those of other industries, especially steel and electronics, was also emphasized, as well as with the tasks contained in national research and development programs and government orders in the area of scientific and technical progress. Attention was drawn to the need to straighten out maintenance and repair in the machine tool industry.



The Presidium affirmed that the machine tool industry can be fully effective and contribute to exports, and must base its development on the principle of self-financing. A comprehensive development program for the industry will be presented to the Government Presidium.

Discussing a program for more efficient use of materials and energy, presented by a government spokesman on matters of efficiency, the presidium of the Planning Commission recognized that its implementation will be an essential requirement for increasing material production and national income for the period 1986-90. This is based on the provisions for that period, according to which 60 percent of the increase in industrial production will be achieved through savings of fuel, raw and other materials. Achieving that goal will require ever increasing use of reserves and the greatest organizational and technological efforts. The center will primarily initiate and support efforts of enterprises aimed at the economic use of fuel, energy and materials. This will be promoted by institutional policies. The center will also conduct a policy of strategic investment. This will be based on plans for structural changes in the national economy as well as on a program of cooperation among the CEMA member-states in the area of efficient and rational use of material supplies up to 1990.

The program for greater savings, elaborated in accordance with the conclusions of the presidium, will be included in the 5-year plan. The meeting was attended by Vice-Premier Zbigniew Szalajda and the heads of the ministries concerned.

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#### POLISH-USSR CHEMICAL INDUSTRY AGREEMENTS

Warsaw RZECZPOSPOLITA in Polish 12 Sep 85 p 2

[Text] In late August and early September talks were held in Warsaw between representatives of the Polish and Soviet chemical industries.

Between ten and twenty draft agreements were approved. They provide for considerably increased cooperation in trade and industrial development. These agreements will help better to solve problems of producers goods and raw materials.

A new agreement provides for deliveries of carbon tetrachloride from Poland to the USSR in exchange for deliveries of freon in aerosol containers, and essential product used in refrigeration. Another agreement provides for deliveries to the USSR of artificial substance recycling plants based on Polish-invented technology, and Polish machines and equipment.

Agreements for the joint construction of new plants to produce important chemicals are especially significant. Thus, for example, a Polish-designed poly-formaldehyde plant will be built at the Nitrogen Factory in Tarnow; polyformaldehyde is an important substance used in construction.

Of great importance for our country is an agreement on the participation of Polish construction enterprises in the construction of a large plant for the manufacture of artificial substances in the USSR, in exchange for deliveries over a period of several years of low-pressure polyethylene and polybutane [?]

All of these agreements provide for increased technical cooperation exchange of specialists and joint solutions to investment problems.

A new and attractive undertaking will be the construction in Poland of an agricultural chemical plant. This will make it possible to finish construction of a plant which was interrupted, and will ensure the development of the enterprise by providing a large market in the Soviet Union, as well as raw materials for the enterprise from the so Soviet Union.

Another joint project will be the completion of a plant to process artificial materials, which will enable us to make better use of our production potential.

All these projects are scheduled to be carried out from 1986 to 1990.

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## TRADE DEALS AT MINING, METALLURGY FAIR

Warsaw RZECZPOSPOLITA in Polish 5 Sep 85 p 4

[Article by Marian Twarog]

[Text] Two basic questions were put to the organizers of the first Silesian International Mining, Energy and Metallurgy Fair, "Simmex-85": is such a specialized undertaking necessary, and if so, was it necessary to put it in Katowice, a city with no tradition of trade fairs? Now, at the end of Simmex, after 5 days of the fair, the answer to both questions is yes.

"Simmex has been very successful," said Vice-premier Professor Zbigniew Messner after visiting the fair. "It is an excellent addition to the International Fair at Poznan, while at the same time not competing with it. I also think it is positive that in Katowice many people directly involved in mining, energy and the steel industry can come to the fair."

Before the beginning of the fair there were no plans to sign any major contracts, since those are concluded, especially in the area of capital goods, only after lengthy negotiations and careful study. Simmex was intended as a promotional fair, and the contacts established in Katowice will pay dividends in the future. And that is essentially how it went, although from the very first day many trade talks took place, e.g. regarding the export of Polish open-pit mining equipment to the USSR, or cooperation in producing and exporting rescue and safety equipment with the FRG firm Dragewerk.

The first important import contract was signed between an Austrian firm and the Polimex-Cekop Foreign Trade Office for a municipal waste processing plant for Katowice. It will not only process half the city's garbage, but will make it possible to recycle metal and glass. The contract, worth 2.5 million dollars, was concluded with the hard currency assistance of the mines.

One of the few foreign trade offices to sign important contracts during the fair was the Kopex enterprise for constructing mining installations abroad. That office concluded inter alia an agreement with the Zenica firm of Yugoslavia worth 30,000 dollars for design services for coal enriching plants; with Westfalia-Lunen firm of West Germany for the import of coal planers and scraper conveyor belts worth 4 million marks; and with other western companies for the delivery to Poland of pumps to Poland for 340,000 marks and

416,000 kroner; of an electric arc furnace housing for almost one a half million DM; sealants from the Jade company of France, etc.

A poll was taken among both foreign and Polish participants in the fair, and the overwhelming majority expressed satisfaction with their visit to the fair and interest in similar fairs in the future. Only a few criticized the relatively meager exhibit for energy, open-pit mining and metal founding.

"Many foreign companies best known for producing equipment for metallurgy made offers to the mining industry, which somewhat dominated this fair," said Andrzej Ruszkarski, vice minister for the metal and machine industries. "I think that the next fair will be more balanced."

Indeed, among the hundred-odd enormous pieces of mining equipment (mechanical miners, heading machines, conveyors and mechanized mine excavators) foreign-produced, Polish-produced and jointly produced by Polish and foreign firms, which were exhibited at the fair, among the whole range of mine safety equipment, exhibits for the other two areas were somewhat lost, especially if they consisted only of diagrams and models. However, visitors did not fail to notice a small, 42-kilogram device: a hoisting winch on cable from Austria, hailed as the "hit" of the fair, which can transport trees, pipes, rails, etc. weighing up to a ton over a distance of 150 meters, and if necessary can serve as a line cableway or a hoist.

"Simmex is a very important exhibition," said Nikolai Myzychenko, a representative of the USSR Chamber of Commerce and Industry in Warsaw. "We have already made Soviet export offers at the Poznan fair. We are here at Simmex simply to see what is happening. But our representatives will certainly take part in the next fair at Katowice."

When the next Simmex fair will take place, for now no one doubts that there should be a next one. 50 of the 55 companies asked expressed a desire to come again. All indications are that that will be two years from now. That, at least, is the opinion of the majority of those concerned.

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### SERIOUS SHORTAGE OF CEMENT SUPPLY

Warsaw ZYCIE GOSPODARCZE in Polish No 35, 1 Sep 85 pp 14-15

[Article by K.F. entitled "Less Cement"]

[Text] All indications are that we are threatened with a severe shortage of cement. We already know now that the cement industry will not produce the 17.3 million tons provided for in the plan. This is due to the dramatic situation during the first quarter of this year, when because of a lack of fuel cement plants produced 1.5 tons less of that construction material than called for by the Plan. Thus production this year will not be greater than 15.7 million tons. As Director Karol Wider, head of the cement producer's association, explained at a press conference at the Ministry of Construction [NDIPMB], there is virtually no chance of making good the losses of winter, since the productive capacity of cement plants working constantly is severely limited by technical capabilities.

To illustrate the ups and downs of the fuel situation in the cement industry, as of 1 January 1984 cement plant storage facilities had about 140,000 tons of coal, while at the beginning of this year the supply was down to 30,000 tons (in all operating cement plants). Daily average deliveries of coal barely amount to 6,000-6,500 tons, while daily consumption is 12,000 tons. Many plants have barely escaped being closed. Moreover, it is worth recalling that a significant portion of installations in modern cement plants fuelled by crude oil are not and have not been operating. The losses are high, since four large plants using that fuel (Kujawy, Nowiny II, Malogoszcz and Warta II) together have a production potential on the order of 4.5 million tons per annum. Unfortunately, imported crude oil (as well as domestic production) are extremely limited.

A serious problem for the cement industry, which was felt with double severity last winter, is its excessive energy consumption. It is still dominated by the wet production technique, characterized by a high level of heat energy consumption. Only 40 percent of total production comes from plants using the dry method, which is twice as energy-efficient (in the GDR 80 percent, and in Czechoslovakia 70 percent of the cement plants use the dry method). To be sure, during the fateful first quarter fuel was allocated first of all to the most efficient producers, but even so it was not possible to avoid the slump.

According to recently adopted guidelines, the cement industry is to receive 3.5 million tons of coal this year (of which 250,000 tons will probably be received after summing up the fuel situation for the first three quarters). But none of this means that more than the above mentioned 15.7 million tons will be produced, of which after fulfilling export commitments, including those to the USSR, the domestic market will get 14.4 million tons, i.e. 1.6 million tons less than last year. Given this situation, it has been decided to allot orders of cement to government and to public housing construction. Other consumers, especially private ones, will have to cope with a serious shortage of cement. This allocation policy is reflected in the statistics for the first 7 months of this year. Only 57 percent of the annual plan for cement deliveries to housing construction project was fulfilled, while other consumers got only 47 percent of the amount of cement called for by the 1985 Central Plan. During this period 606,000 tons of cement and clinker were exported, including 240,000 tons to the Soviet Union.

It is predicted that the overall export plan will be overfulfilled by about 200,000 tons (1.4 million tons are expected to be produced, while the Central Plan calls for 1.2 million tons), however, cancellation of exports is out of the question because that is the only source of hard currency necessary to buy spare parts for machinery. Increased exports to the Soviet Union are the result of a compensatory agreement: in exchange for cement the Soviets will supply the Polish housing industry with bathtubs, water-heaters, steel for reinforced concrete, facing and other finishing materials.

The shortage of cement, as was affirmed at the Ministry, is of a temporary nature. Nevertheless, it will doubtless complicate the situation for individual construction and individual investments in the countryside.

9970/12951

CSO: 2600/18

ECONOMY

POLAND

#### FACTORS IMPEDING COAL PRODUCTION

Warsaw RZECZPOSPOLITA in Polish 11 Sep 85 p 2

[Text] Making the maximum effort, miners were able to deliver 128.5 million tons of coal by the end of August. There thus remain 63 million tons of that fuel to be mined by the end of the year to satisfy domestic needs, which are estimated at 191.5 million tons.

This can be done, though it will be under difficult economic conditions. Miners point to the lack of transport equipment. There is also a shortage of certain kinds of machines and tools, such as supports, mechanized mine excavators, overhead cableways, and mechanical cutters; which in turn is due to a shortage of steel products. These matters were discussed at a meeting of mining enterprise directors which took place on 10 September in Katowice.

The discussion also dealt with uninvested reserves of the mining industry, the use of which would make possible, or at least facilitate, the accomplishment of these tasks by the end of the year. The meeting was presided over by the Minister of Mining and Energy, Gen. Div. Czeslaw Piotrowski.

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ECONOMY

POLAND

#### BRIEFS

**STARGARD-GDANSK RAIL ELECTRIFICATION**--Work has begun on the electrification of the mainline from Stargard to Gdansk. It is scheduled to be completed in 1989. This will improve the movement of freight and passengers on the coastal railroad. Electrification is also being done to protect the environment. [Text] [Warsaw RZECZPOSPOLITA in Polish 6 Sep 85 p 5] 9970

**POLISH-LIBYAN TRADE TALKS**--On 11 September Vice Premier Janusz Obodowski received the Secretary of the People's Committee of the People's Bureau of the Libyan Arab People's Socialist Jamahiriya in Warsaw, S.A. el Areibi. The present state of Polish-Libyan economic cooperation and trade was discussed, with special emphasis on the upcoming 7th session of the joint committee. Special attention was given to the need to increase Polish exports to Libya, and also the need to speed up financial settlements in accordance with earlier agreements. [Text] [Warsaw TRYBUNA LUDU in Polish 12 Sep 85 p 2] 9970

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CSO: 2600/18



ECONOMY

ROMANIA

#### NEW SOURCES OF RAW MATERIAL FOR AIRCRAFT PLYWOOD

Bucharest INDUSTRIA LEMNULUI in Romanian No 3, Aug 85 pp 137-141

[Article by Rodica Sfaca and D. Marinescu, Research and Design Institute for the Wood Industry]

[Text] This article is a brief presentation of the introduction of aircraft plywood, of its raw materials throughout the world, and of the manner in which this matter has been handled in our country.

Considering the domestic resources of raw materials, tests were conducted with woods (alder) which could be substituted for birch, the traditional raw material of imported aircraft plywood. The physical and mechanical characteristics of either alder or birch experimental aircraft plywoods, meet the technical specifications required for this type of plywood throughout the world, the alder plywood offering definite advantages because the raw material is obtained from logs of different sizes and of very high quality.

#### General Considerations

The worldwide production of aircraft plywood has undergone a general constant growth, being determined by the immediate needs of a field which changes significantly from one period to another.

The production of aircraft plywood is associated both with countries that have a well developed aircraft industry, and with specific time periods. In England for instance, the production of aircraft plywood was of major importance during World War II, and dropped noticeably beginning in the 1960's.

The basic wood used in England and North America to produce aircraft plywood has generally been birch. Yellow birch (*Betula lutea*) yields a valuable veneer, whose sole disadvantage is the presence of small areas of twisted fiber, which must be removed. The density and strength of western white birch is lower than that of yellow birch, but its fibers are straight; the presence of small knots prevents the production of large areas of veneer from this wood. Silver maple (*Acer sacharium*) has been used in the absence of birch, and especially of yellow birch.

Table 1. Physical and mechanical characteristics of birch aircraft plywood

No.	Caracteristici	U/M	(A) Valori obținute pe loturi					
			(B) Placaj de 0,8 mm			Placaj de 1,0 mm		
			min.	med.	max.	min.	med.	max.
1	Densitatea aparentă la umiditatea de 12%	kg/m <sup>3</sup>	846	852	892	638	670	725
2	Masa pe metru pătrat	kg/m <sup>2</sup>	0,757	0,799	0,840	0,803	0,847	0,876
3	Umiditatea	%	5,5	5,6	5,9	5,0	5,2	5,5
4	Rezistența la forfecare	N/mm <sup>2</sup>	23	27	30	19	24	27
5	Rezistența la tracțiune paralel cu fibrele	N/mm <sup>2</sup>	75	95	112	89	97	112
	perpendicular pe fibre	N/mm <sup>2</sup>	48	63	76	42	54	74
6	Raza minimă de curbare							
	— longitudinal	mm	23	32	50	38	65	75
	— transversal	mm	15	16	20	12	17	20

- (1) Apparent density at 12 percent humidity
- (2) Weight per square meter
- (3) Humidity
- (4) Shear strength
- (5) Tensile strength
  - Parallel to the fibers
  - Perpendicular to the fibers
- (6) Minimum radius of curvature
  - Longitudinal
  - Transversal
- (A) Lot values
- (B) Plywood with a thickness of ...

In America, several species of mahogany have been used for their high strength, uniform texture, and dimensional stability. In Germany and other central European countries, aircraft plywood has been fabricated from European birch (*Betula alba*) and beech (*Fagus silvatica*). During the war, Canada and North America also used large quantities of aircraft plywood obtained from spruce.

The USSR is one of the countries in which aircraft plywood is currently manufactured on a large scale using birch.

The production of plywood for aircraft, ship, model, and other construction was considered in Romania as early as 1952, with the establishment of the general standard STAS S 28-52, "Special RA and RF Spruce Plywood"; however, this type of plywood found little application at that time since it was possible to import the aircraft plywood needed by various sectors of the economy.

In recent years, ICPII (Research and Design Institute for the Wood Industry) has conducted research aimed at developing a technology for manufacturing various types of fireproof aircraft plywood in Romania, primarily for our aircraft industry, using the available raw materials and the technical resources available in the sector.

**Table 2. Physical and mechanical characteristics of birch aircraft plywood**

Nr crt	Caracteristici	U.M.	(A) Valori obtinute pe loturi					
			(B) Placaj de 1.5 mm gr.			Placaj de 2.0 mm gr.		
			min.	med.	max.	min.	med.	max.
1	Densitatea aparentă la umiditatea de 12%	kg/m <sup>3</sup>	576	594	611	564	585	600
2	Masa pe metrul pătrat	kg/m <sup>2</sup>	1,01	1,04	1,09	1,16	1,18	1,20
3	Umiditatea	%	3,3	4,8	6,6	3,7	4,2	6,6
4	Rezistența incleierii la forfecare în:							
	— stare uscată	N/mm <sup>2</sup>	1,2	1,9	2,3	1,12	1,49	1,57
	— stare umedă	N/mm <sup>2</sup>	1,7	1,8	2,0	0,77	1,33	2,07
5	Rezistența la forfecare	N/mm <sup>2</sup>	15,0	17,0	18,0	13,0	19,0	22,0
6	Rezistența la tracțiune							
	— paralel cu fibrele	N/mm <sup>2</sup>	81,0	92,0	106,0	70,0	77,0	83,0
	— perpendicular pe fibre	N/mm <sup>2</sup>	84,0	95,0	101,0	63,0	71,0	85,0
7	Raza minimă de curbare							
	— longitudinal	mm	75,0	96,0	125	68,0	81,0	125
	— transversal	mm	25	29,0	38,0	37,0	38,0	50,0

(1) Apparent density at 12 percent humidity

(2) Weight per square meter

(3) Humidity

(4) Adhesive shear strength

Wet condition

Dry condition

(5) Shear strength

(6) Tensile strength

Parallel to the fibers

Perpendicular to the fibers

(7) Minimum radius of curvature

Longitudinal

Transversal

(A) Lot values

(B) Plywood with a thickness of ...

#### **New Sources of Raw Materials. Technical Aspects**

The research and experiments were intended to eliminate the importation of aircraft plywood, and to supply the national economy with the necessary plywood from microproduction (500x500 mm sheets) and industrial production (1200x1200 mm sheets). Given the existing domestic resources and the quality of some native woods (especially birch), the experiments also covered other kinds of wood such as spruce, alder, and poplar, which can be expected to replace birch as the traditional, imported source of raw material for aircraft plywood.

The ICPII pilot line has formulated a technology for fabricating aircraft plywood in 500x500 mm sheets with thicknesses of 0.8, 1.0, 1.5, and 2.0 mm, using technical veneers of birch, alder, and poplar.

**Table 3. Physical and mechanical characteristics of alder aircraft plywood**

Nr crl.	Caracteristici	U. M.	(A) Valori obtinute pe loturi					
			(B) Placaj de 0.8 mm grosime			Placaj de 1.0 mm grosime		
			min.	med.	max.	min.	med.	max.
1	Densitatea aparentă la umiditatea de 12%	kg m <sub>3</sub>	584	602	615	599	611	679
2	Masa pe metru pătrat	kg m <sub>2</sub>	0,630	0,643	0,650	0,800	0,858	0,961
3	Umiditatea	%	8,0	10,0	14,0	11,0	11,0	13,0
4	Rezistența la forfecare:							
	— paralel cu fibrele	N mm <sub>2</sub>	10,4	16,3	20,0	19,6	22,9	28,7
	— perpendicular pe fibre	N mm <sub>2</sub>	19,5	19,9	20,4	20,7	23,2	29,6
5	Rezistența la tracțiune:							
	— paralel cu fibrele	N mm <sub>2</sub>	31,0	54,0	67,0	32,0	60,0	68,0
	— perpendicular pe fibre	N mm <sub>2</sub>	29,0	31,0	39,0	29,0	34,0	37,0
6	Raza minimă de curbare							
	— longitudinal	mm	63	70	75	63	76	100
	— transversal	mm	20	21	30	15	18	20

(1) Apparent density at 12 percent humidity

(2) Weight per square meter

(3) Humidity

(4) Shear strength

Parallel to the fibers

Perpendicular to the fibers

(5) Tensile strength

Parallel to the fibers

Perpendicular to the fibers

(6) Minimum radius of curvature

Longitudinal

Transversal

(A) Lot values

(B) Plywood with a thickness of ...

Aircraft plywood must meet the W. A. 21.560 technical specifications for fire resistance, imposed for interior construction and appointments in aircraft.

Birch and alder veneers shaped and dried to 4-5 percent humidity, were subjected to a fireproofing process.

The impregnation consists of placing the veneers into a metal container in which they are separated from each other by wire screens, and of plunging them into two baths as follows:

a) Hot Bath

Solution temperature at dipping: 70-80 degrees C;

Veneers maintained in the solution at this temperature for 30 minutes;



**Table 4. Physical and mechanical characteristics of alder aircraft plywood**

Caracteristici	
1	Densitatea aparentă la umidit. de 12%
2	Masa pe metru pătrat
3	Umiditatea
4	Rezistența încleierii la forfecare -- în stare uscată -- în stare umedă
5	Rezistența la forfecare -- perpendicular pe fibre -- paralel cu fibrele
6	Rezistența la tracțiune -- paralel cu fibrele -- perpendicular pe fibre
7	Raza minimă de curbare -- longitudinal -- transversal

U. M.	(A) Valori obținute pe loturi					
	Lot placaj de 5 mm			(B) Lot placaj de 2,0 mm		
	min.	med.	max.	min.	med.	max.
kg/m <sub>3</sub>	615	621	633	623	698	774
kg/m <sub>2</sub>	—	1,01	—	1,5	1,7	1,8
%	—	9,0	—	—	9,0	—
N/mm <sup>2</sup>	—	2,0	—	1,3	1,9	2,4
N/mm <sup>2</sup>	1,6	1,7	1,8	—	1,7	—
N/mm <sup>2</sup>	13,8	14,5	15,0	13,8	11,0	14,4
N/mm <sup>2</sup>	14,2	17,0	19,5	14,4	15,0	17,4
N/mm <sup>2</sup>	38,4	49,0	50,9	38,0	38,0	99,6
N/mm <sup>2</sup>	38,0	45,0	47,7	29,4	35,0	40,9
mm	125	130	150	—	125	—
mm	65	67	75	50	55	65

- (1) Apparent density at 12 percent humidity  
 (2) Weight per square meter (3) Humidity  
 (4) Adhesive shear strength Wet condition  
 Dry condition  
 (5) Shear strength Parallel to the fibers  
 Perpendicular to the fibers  
 (6) Tensile strength Parallel to the fibers  
 Perpendicular to the fibers  
 (7) Minimum radius of curvature Longitudinal  
 Transversal  
 (A) Lot values (B) Plywood with a thickness of ...

**Table 5. Physical and mechanical characteristics of birch and alder aircraft plywood**

Caracteristici
1 Densitate aparentă la $U = 12\%$
2 Masa pe metru pătrat
3 Umiditatea
4 Rezistența la forfecare :
- în stare uscată
- în stare umedă
5 Rezistența la forfecare paralel cu fibrele
6 Rezistența la tracțiune :
- paralel cu fibrele
- perpendicular pe fibre
7 Raza minimă de curbare :
- longitudinal
- transversal

C. M.	(A) Valori medii obținute							
	Placaj de 0,8 mm		Placaj de 1,0 mm		Placaj de 1,5 mm		Placaj 2,0 mm	
	mesteacăn (C)	alin (B)	mesteacăn (C)	alin (D)	mesteacăn (C)	alin (D)	mesteacăn (C)	alin (D)
kg/m <sup>3</sup>	852	602	670	611	594	621	585	698
kg/m <sup>2</sup>	0,799	0,613	0,847	0,858	1,010	1,010	1,180	1,700
%	5,6	10,0	5,2	11,0	1,8	9,0	5,2	9,0
N/mm <sup>2</sup>	—	—	—	—	1,90	2,00	1,40	1,90
N/mm <sup>2</sup>	—	—	—	—	1,80	1,70	1,30	1,70
N/mm <sup>2</sup>	27,0	10,3	24,0	22,0	17,0	17,0	19,0	15,0
N/mm <sup>2</sup>	95	54	97	60	92	49	77	88
N/mm <sup>2</sup>	63	31	54	34	85	45	71	35
mm	32	70	65	75	90	130	81	125
mm	16	23	17	18	29	67	38	55

- (1) Apparent density at 12 percent humidity
- (2) Weight per square meter
- (3) Humidity
- (4) Adhesive shear strength
  - Wet condition
  - Dry condition
- (5) Shear strength parallel to the fibers
- (5) Tensile strength
  - Parallel to the fibers
  - Perpendicular to the fibers
- (7) Minimum radius of curvature
  - Longitudinal
  - Transversal
- (A) Lot values
- (B) Plywood with a thickness of ...
- (C) Birch
- (D) Alder

b) Cold Bath

Solution temperature 30-40 degrees C;  
Duration of immersion: 30 minutes.

The composition of the aqueous impregnation solution (concentrations) is:

10 percent ammonium phosphate  
10 percent ammonium sulfate  
3.3 percent sodium fluoride

The consumption of fireproofing material is 85 kg/cubic-meter of plywood, as follows:

41.0 kg/cubic-meter ammonium sulfate  
41.0 kg/cubic-meter ammonium phosphate  
3.0 kg/cubic-meter sodium fluoride

Following immersion in the cold bath, the containers are removed from the tank and suspended above it for about 30 min to drain the excess solution. The impregnated veneer is aired for 2 hours, after which it is dried to 12 percent humidity for tegofilm gluing. After drying, the veneers are sorted and combined to fabricate the sheets needed for ply-stacking.

Depending on the thickness of the plywood and the available plys, the following assemblies were used:

- a. For a thickness of 0.8 mm, three 0.3 mm plys: 0.3, 0.3, 0.3;
- b. For a thickness of 1.0 mm, three 0.4 mm plys: 0.4, 0.4, 0.4;
- c. For a thickness of 1.5 mm, three 0.6 mm or two 0.3 mm and one 1.1 mm plys: 0.6, 0.6, 0.6; or 0.3, 1.1, and 0.3;
- d. For a thickness of 2.0 mm, three 0.7 mm plys: 0.7, 0.7, 0.7.

The plys were generally alternated 90 degrees to each other.

The ply stacks were glued together with a phenolic film (tegofilm), with a weight of about 60 g/sq meter.

They were pressed at 25 kgf/sq-cm and a temperature of 145 degrees C, for a basic duration of 5 min plus 1 minute for each 1 mm of plywood thickness.

A somewhat higher pressure is necessary to slightly densify the plywood sheets for greater elasticity and strength.

Tests disclosed the following problems associated with the fabrication of thin plywood:

For very thin veneers of 0.3 and 0.4 mm, both centered and eccentric cutting are recommended, the latter producing uniform veneer thicknesses;

Due to small log diameters, many strips were obtained during cutting, which were suitably combined using fusible filaments, but which required additional manpower;

Excessive handling leads to a deterioration of thin veneers, with obvious increases in specific consumption;

After pressing, particular attention must be devoted to conditioning, the plywood requiring tight stacking under weights, with slow cooling.

#### Physical and Mechanical Characteristics of Aircraft Plywood

Birch and alder aircraft plywood produced both by the ICPIIL pilot line and industrially in thicknesses of 0.8, 1.0, 1.5, and 2.0 mm, was laboratory tested to determine its physical and mechanical characteristics; the tests were performed for the user (ICA Ghimbav Brasov) on the basis of French AIR 9350-3, 5, 7, 8, 14, 15, 16, 17, 18 standards.

The following characteristics were determined:

Apparent density at 12 percent humidity;

Weight per square meter;

Humidity;

Shear strength;

Adhesive shear strength (in wet and dry condition), only for 1.5 and 2.0 mm-thick plywood;

Tensile strength parallel and perpendicular to the fibers;

Minimum radius of curvature longitudinally and transversally.

The results of the tests are shown in tables 1 and 2 for birch aircraft plywood, and in tables 3 and 4 for alder aircraft plywood.

To establish the differences between birch aircraft plywood (which is currently used in aircraft construction), and thin alder plywood (which tends to be used as a substitute for the traditional material), comparative physical and mechanical tests were performed, whose results are given in table 5.

The data leads to the following findings:

The physical and mechanical characteristics of experimental aircraft plywood, both birch and alder, satisfy the technical requirements for this type of plywood throughout the world;

Comparative tests of thin birch and alder plywood show that no significant differences exist from this standpoint, with the alder plywood meeting the user's requirements equally as well as the birch plywood.



## Conclusions

Tests carried out at ICPII to fabricate thin plywood (0.8, 1.0, 1.5, and 2.0 mm) have demonstrated the feasibility of industrial production of this type of plywood for our aircraft industry and for modeling, making it possible to stop its importation and manufacture it with domestic resources.

Experiments with alder aircraft plywood have shown that this wood can satisfactorily replace the birch traditionally used in this field, with distinct advantages in wood quality and log dimensions.

This research has opened the possibility of using new sources of raw materials in the aircraft plywood and modeling industry, which will complement and replace existing ones, with all the consequent economic advantages.

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CSO: 2700/12

MILITARY

POLAND

#### COMPULSORY MILITARY SERVICE REGULATIONS REVIEWED

Warsaw ZOLNIERZ POLSKI in Polish No 40, 6 Oct 85 p 21

[Unattributed Article: "Being a Soldier..."]

[Text] Defense of the Motherland is a constitutional obligation of every citizen. This comprehensive duty entails the obligation to serve in the armed forces, which includes:

- serving a tour of basic service by draftees (detailed below);
- taking military training and instruction by college students and graduates;
- participating in exercises and taking annual military training by reservists;
- being in active service in the event mobilization is declared and in time of war by draftees and reservists;

Within the framework of compulsory military service, draftees can also be assigned to alternative service and basic service in civil defense.

#### Military Service of College Students and Graduates

This form of service involves participation in military classes in the course of study and taking military training outside the framework of college study or after graduation.

Military classes are a required subject included in the curriculum.

Military training can be long-term (up to 12 months) and involves participation in classes of the SPR [Reserve Officer Cadet Training School] and practical training in a military unit.

Short-term military training (up to 3 months) involves specialized practical training in military units.

## **Annual Training of Reservists**

Compulsory military service by reservists involves, among other things, participation in annual training. The latter as a rule takes place in military units.

A reservist can be called up for day (up to 24 hours), short-term (2 to 30 days) and long-term (31 to 90 days) annual training.

The combined time for which a reservist can be called up for annual training over his entire service in reserves cannot exceed:

--for personnel with ensign and officer ranks - 24 months;

--for personnel with non-commissioned officer rank and privates - 12 months.

## **Periodic Military Service**

Non-commissioned officers, ensigns and reserve officers are called up for periodic military service.

The combined duration of such service cannot exceed 24 months over the time an individual remains in reserve.

## **Alternative Service by Draftees**

Alternative service by draftees involves work in the units of socialized health care, social welfare, environmental protection and other public service institutions. At the time of service the draftees take civil defense training.

Alternative service by draftees lasts 24 months. The draftees can be confined to post.

Individuals in this service are not soldiers; however, upon completion of the service they are transferred to reserves and are not called up for basic service. Draftees are assigned to the alternative service exclusively at their request.

## **Basic Service and Training of Draftees in Civil Defense**

Basic service in civil defense involves fulfilling civil defense assignments and lasts 24 months. During the service, the draftees are granted the title of brigade member.

Civil defense training of draftees involves attendance of training sessions organized in civil defense units after business hours for 3 years and training at a camp for 30 days. The combined duration of draftee training in civil defense units cannot exceed 60 days a year, including 20 statutory days-off.

## Responsibilities and Rights of Draftees

Before becoming a soldier, every young man is a registrant and a draftee, which entails certain responsibilities for him.

A registrant (a male who turns 18 years old in a given calendar year) is obliged to report for registration combined with a medical examination at a specified location and time. Registration is aimed at a preliminary selection of registrants on the basis of their physical condition, professional skills and other qualifications for military service.

A draftee (a male who turns 19 years old in a given calendar year) is obliged to report for the draft. This requirement applies until the end of the calendar year in which the draftee turns 24 years old (or 28 years old in case he could not be drafted sooner).

Individuals eligible for the draft must report to the regional draft board with jurisdiction over their permanent or temporary place of residence. They must produce for the board their ID card and a document specifying their education, profession, specialty within the profession, defense or military training received, vocational training as well as medical documents regarding their health in their possession.

It should also be recalled that, beginning with the day registration for those turning 18 years old in a given year is declared, males are obliged to comply with the military notification requirement. The latter involves notifying local organs of state administration at the basic level or relevant military organs of changes in place of residence, first or last name, education and profession. Also, males are responsible for securing authorization from military organs for a temporary stay abroad.

To the Army March! March...

Basic military service is the most comprehensive form of complying with the obligation of military service. Draftees fit to serve on the basis of their health aged from 19 to 24 years are called up for service (in case the induction could not occur at that time, it can occur until the end of the calendar year in which a male turns 28 years old). Also, a male having turned 17 years of age can volunteer for basic military service.

Ministers of the Interior and Defense institute the draft into the basic service whereas governors (mayors of cities with the status of a province) carry it out in cooperation with the chiefs of provincial military headquarters and gmina, city and district commissioners through provincial and district draft boards. These boards determine the fitness of a draftee for service as well as its eventual deferment.

Basic military service lasts 24 months, and in seaborne units - 36 months. In certain cases, when it is necessary for safeguarding state security, the Council of Ministers can extend the duration of basic military service by no more than 12 months. Soldiers in basic service are in indefinite active



service if mobilization is declared, in time of war or introduction of the state of marital law.

Draftees inducted into basic military service are assigned to [large] military units and subsequently to individual subunits and given posts and positions. In the initial period of service, the draftees take basic training at the end of which they take the military oath.

Through the remainder of basic service, the enlisted men are trained in military occupations pertinent to the posts and positions assigned to them.

Enlisted men are given the rank of private at the time they report for basic military service. During their tour of duty, they can be promoted to higher military ranks (including that of senior corporal). Promotions are predicated on, among other things, satisfactory results in training, discipline and conscientious attitude to one's obligations as well as the appropriate morale and political attitude.

During their tour of duty, enlisted men can be transferred to other military units in the line of duty (or at their own request if the good of the service so allows).

Enlisted men in basic service are entitled to annual leaves, leaves due to special conditions of service, leaves for honorary blood donors, leaves for exemplary service, leaves on health and compassionate grounds.

Enlisted men in basic service can apply for certification as skilled workers or foremen in specific professions provided they have complied with the requirements for such certification.

Upon completion of basic military service, enlisted men are transferred to reserves.

Note: Readers interested in this topic should refer to the detailed articles entitled "Before They Walk into the Barracks" published in ZOLNIERZ POLSKI Nos. 15 and 16 in April 1985.

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POLITICS

CZECHOSLOVAKIA

PROSPECTS FOR HUMAN RIGHTS EVALUATED

Muted Opposition

Vienna PROFIL in German 28 Oct 85 pp 62-63

[Article by Hermann Dworzak: "Svejk Is Alive"]

[Text] While its neighboring countries have started to move, in the CSSR the somberness which began in 1968 continues--brightened only occasionally by cunning on the part of the man-in-the-street.

Two border crossings--two typical situations in "normalized" Czechoslovakia. Ceske Velenice. The train to Prague has just passed the Iron Curtain. An elderly man addresses me in German. "There are many people in your country who don't appreciate freedom," he says casually. Though retired for some time, he has not come up with more than 900 korunas a month--including cost-of-living increases--in the past couple of years. (Officially the average income in the CSSR is stated to be 2,900 korunas a month.) So, despite his advanced age, he is forced to earn additional money by working at home.

The scene changes to Bratislava. At the Petralka border crossing, there is a kennel right next to the customs building. Whoever is finished with his passport formalities is generally confronted with the yelping of the vicious curs. In 1968--in the Prague Spring--Czechoslovakia embarked on stripping off the Stalinist straitjacket, taking the first steps toward "socialism with a human face." At Petralka in 1985 one immediately gets to know its animal grimace.

Leaving the Main Railway Station in Prague, I feel at first as if I had arrived in Linz; the bad air almost takes my breath away. From Hradcany castle I later see the huge bell of smog resting on the city. Right off, the Zizkov, the national memorial for Husite leader Jan Zizka, is only barely visible because of the yellowish sulphur veil.

Protection of the environment is leading a particularly frugal existence in the CSSR. An "Analysis of the Ecological Situation in Czechoslovakia"--commissioned by the government--is being kept under lock and key to this day in Czechoslovakia. Supporters of the civil rights movement "Charter 77" managed to get hold of the document, however, and saw to it that it was

published--in the West. Concerning the environmental protection budget, it states: "In the USSR expenditures on all environmental protection amount to 2.7 percent of the national income, in Sweden to 0.8 percent, in the United States to 1.5 percent, in the FRG to 2 percent of the gross national product. Even though these data are not quite comparable from the methodological point of view it is indisputably ominous that in this country such expenditures in the sixth five-year plan (1976-1980) amount to only 0.3 percent of utilized national income and to 0.85 percent of total investments."

The Czechoslovak-Hungarian Hainburg is called Gabčíkovo-Nagymaros. For the joint power plant planned there, the Austrian construction firm Universale has just managed to obtain a 400-million-schilling contract. In a publication of Hungarian environmentalists published in mid-September with a foreword by Charter 77, fears are expressed that the construction of the power plant may have negative effects on the CSSR drinking-water supply.

The somber situation of the environment has its parallel in the poor cultural state of affairs. In 1963 the Austrian reform communist Ernst Fischer demanded at the legendary Kafka conference in Liblice, which was to mark the beginning of the Prague Spring, that the East issue a "permanent visa" to the author previously ostracized in the East. Asked today how Franz Kafka is faring in the CSSR, Frantisek Kautman, who participated in the Liblice conference says: "In 1983 and 1984 some pieces by him were printed, and a collection of stories was published in a small edition. There is no research. Actually Kafka is in exile again."

A salesman in the bookstore where I bought the books with the materials of the Liblice conference in 1967 provides the proof saying: "You can't find anything by Kafka here; he is taboo in this country."

A letter by Charter 77 to the Budapest Forum of the Conference on Security and Cooperation in Europe (CSCE) also signed by Nobel Prize laureate Jaroslav Seifert, states: "With the year 1968 there began in Czechoslovakia a long era of the destruction of all significant values of a sovereign national culture, which in various ways recalls the 1950's, and in some respects even worse things."

A young film maker speaks of the "sterility of the official cultural activity," saying that "only on the fringes is there a spark here and there." Thus the "Concerto Grosso" of mime Boris Rybner is traded as a confidential tip.

After 8 pm no pedestrians can be found in hardly any streets of Prague. Only every now and then a small bunch of young people gather on the Charles Bridge to make music. "Only here, because of the strangers," says one of them, "is there a chance that we will not be driven away right away by the police."

The taverns are chock full, on the other hand, with beer flowing freely. Author Jan Pelc says about the situation of young people in northern Bohemia: "There are no places where one could meet. Everywhere one encounters the regime, its extended arm. And so one goes to the only place whose doors are still open--the tavern."

Next to drinking, a weekend trip to the chata (cottage) is one of the most widespread possibilities of escaping the oppressive reality. One-quarter of the 450,000 Prague households have such a second residence, trying to get away there from the Kremlin brother and his local deputy.

The press has the vivacity of a mortuary. Even party boss Gustav Husak found the boredom too much. He made the statement: "Everything is quite all right with the newspapers, only they are often not readable."

Western television is generally in. In Plzen police built a joint antenna to get better reception of the FRG channels. On weekends one sees long lines in front of the newsstands in Bratislava. People fight for a copy of the KPOe [Austrian Communist Party] VOLKSSTIMME--because of its TV supplement.

After the setbacks of 1981 and 1982 the current economic situation of the CSSR is classified as "relatively favorable" (SUEDEDEUTSCHE ZEITUNG). The following are considered pluses: The strong increase in agricultural production, the positive balance of trade since 1980 and the small indebtedness to the West. The last is estimated to be 1 or 2 billion dollars--contrasting with a total of 75 billion dollars for all CEMA countries.

In 1968 the Kremlin brutally foiled the attempt to join socialism and democracy. Following that, the bureaucracy brutally proceeded to cement its endangered position again. Half a million party members were purged, and another several hundred thousand lost their jobs. Corruption is in full bloom,\* whether in getting an apartment, in hospital treatment or in the case of the numerous "rubber stamps" needed for a trip abroad.

The reaction of the population: Apathy, internal emigration and a Svejtek attitude. On the "Lennon wall" in the Prague District of Kleinseite, one can see the attitude of resignation expressed as follows: "Vy mate Lenina --nechte nam Lennona" (you have Lenin, leave us Lennon). A former journalist, now a concierge in a hotel, says: "Colleagues speak quite openly about the machinations of those in power. Of course one belongs to the party and does one's duty on 1 May. But no one believes the swindle of those at the top."

Whoever is engaged in opposition activity is under surveillance, suffers from chicanery or is put in prison. "Bugs" are the rule in apartments of the Charter signatories. When the current Charter spokeswoman Petruska Sustrova moved to another apartment, the new tenants during remodeling found a monitoring device "made in England" and gave it to Sustrova as a "souvenir." It did not take long for the police to appear at her place and ask that she return their "tool." The Catholic priest Vaclav Maly in September was interrogated and abducted into a wood by the State Security Service. Lenka Mareckova, a 22-year-old civil servant, was tried twice after personal

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\*As the London TIMES reports, Czechoslovak Finance Minister Leopold Ler was placed under house arrest because he was involved in a huge scandal concerning the smuggling of foreign currency, jewelry, Western consumers' goods and perhaps also drugs.



intervention by the justice minister and in the second trial was sentenced to unconditional imprisonment for several months for having composed a poem "Death of a Dictator" (about Leonid Brezhnev).

Despite the repression the regime has not managed to silence the opposition. The Charter will soon be entering the 9th year of its existence. Its ranks accommodate various philosophical and political trends. Whereas Ladislav Hejdanek, for example, is betting primarily on positive effects of a possible Moscow course of reform (see interview below), Trotskyite Petr Uhl eyes the "fall of the bureaucracy" through mass resistance. He says: "It is a question of struggle here and of the international synchronization of the independent movements in East Europe. That creates the prerequisites for being able to intervene in an explosive situation."

The Catholic movement critical of the regime is on the upswing. After the big Method celebration in Velehrad in July, recently more than 30,000 pilgrims gathered at Sastin, a place of pilgrimage in western Slovakia--most of them young people. The most popular slogan shouted in unison was "We want the pope."

While holding the reins of power, the regime has no access to the hearts of the people. Though an economic reform is overdue, there is no threat of an "economic collapse like that in Poland in the late seventies." The opposition is present but far from being able to endanger the bureaucracy. High hopes continue to be played down. Another inscription on the Lennon wall reads: "To dream is our only freedom."

#### Interview With Human Rights Advocate

Vienna PROFIL in German 28 Oct 85 p 65

[Interview with Ladislav Hejdanek, member of the human rights movement Charter 77 and its spokesman from 1977 to 1980, by Hermann Dworczak--in a park (to prevent its being monitored): "'Gorbachev Too Is Censured Here'"]

[Text] PROFIL: The economic situation in Czechoslovakia does not seem to be all that bad.

Hejdanek: Yes, it looks that way on the surface. But economists say that actually things are much worse. Many data have merely been invented, and the government has no accurate overview. There are, for instance, seven different kinds of korunas as accounting units, which makes it utterly impossible to fathom the situation.

PROFIL: Politically it is an ice age.

Hejdanek: Since the great shock of 1968 there has been a general lack of perspective. Most people concentrate on purely personal questions. In this situation the Charter began to demonstrate that a no is also possible. Compared with the Polish *solidarnosc*, our activity may look "juiceless." But in light of the fact that there is no great pressure from below, it borders on a miracle that it exists at all.

PROFIL: Is there only latent discontent?

Hejdanek: In certain situations criticism also manifests itself openly. Particularly whenever a lot of people meet--for example, on a train or on a bus. Then quite unambiguous remarks are made.

PROFIL: There is the classic Svejek, and Brecht's Svejek in World War II; how does today's Svejek act?

Hejdanek: For example, he undermines measures from above, so that it looks after only 2 or 3 weeks as if these measures had never existed. In a factory a hundred people regularly show up late, but some fellow workers work the time clock for them. Management finds out about it and sets up a special check at the gate. For a couple of weeks perhaps, the loafing stops. Then suddenly other "difficulties" crop up somewhere else in the factory. The checkers are transferred there, and the old cycle starts over.

PROFIL: The Charter has published a document about the cultural situation in Czechoslovakia.

Hejdanek: It is no exaggeration to say that the cultural situation is a disaster. In the physical sciences too we are a number of years behind. The state of the humanities and social sciences is particularly serious. There the lecturing is done almost exclusively by opportunists who do not believe themselves what they concoct. Unless there is a change soon, the damage will be beyond repair for as long as two generations.

PROFIL: The Charter also took a stand on environmental questions.

Hejdanek: Not directly. We help those who get involved in ecological questions. The same, incidentally, is true of the peace movement. If one deals critically with environmental problems, one can easily be treated as a psychiatric case. The authorities will check his personal situation and make trouble for him at work. In other words, they will try to destroy him.

PROFIL: What are the causes of the increased Catholic resistance?

Hejdanek: To keep things short, I would like to talk only about Bohemia. After World War I quite a few Catholics turned against the republic and later even flirted with Hitler's Munich agreement. After World War II Catholics were under unbelievable pressure, being the group that was treated worst. Events in Poland have given them self-assurance. The state priests organization "Pacem in terris" is not being taken seriously by anybody; it exists purely on paper.

PROFIL: Occasionally one hears the term "underground church."

Hejdanek: I think this term is inappropriate. The church is not regulated and cannot be regulated. There is no long-range program, however. Today it is rather a question of survival; in the future the basis for something bigger may emerge.

PROFIL: Is the regime firmly in the saddle?

Hejdanek: Definitely not. Without the support of the Soviet authorities it would be gone in a few weeks. The situation in this country is as artificial as can be. Those in power need not be concerned with any kind of public opinion. Even Gorbachev's attacks against corruption were censured by them. A line of reform at the Kremlin could become a danger for the regime in this country. Our hope is that it will perish when the course of reform is imitated.

PROFIL: How long can the current situation of the freeze of social contradictions last?

Hejdanek: That is primarily an economic question, a question of how long it is possible to corrupt the population by artificially maintaining the standard of living. No one knows our debts in the East, and one cannot foresee how long the Kremlin will be prepared to bear the burdens of the satellite countries. Without external changes--in other words, reforms in the Soviet Union --the current situation may last another 10 or 15 years or even longer.

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POLITICS

HUNGARY

PARTY EFFICACY, DISCIPLINE SEEN WANTING

Budapest PARTELET in Hungarian No 8/9, 1985 pp 82-86

[Article by Jozsef Szetel, deputy director, Directorate of Instruction, Csongrad Megye: "Political Efficacy of the Work of Party Organizations"]

[Text] With full knowledge of the decision of the Congress many primary party organization leaders are raising the question: how might it be possible to direct the work of the party organization more successfully, more effectively than heretofore? According to my observations the election of officials is the time when big decisions are made, new solutions are introduced, and indeed the machinery of leadership begins to function more smoothly. After a time however the old difficulties appear anew, often in even more heightened form. I see the cause of this quinquennially-repeated phenomenon in the fact that the "starting over" is not sufficiently established, not thought through deeply enough. Old and new leaders alike are satisfied--often compelled to be satisfied--with introducing more or less practical "innovations," which prove effective temporarily, with luck even in the longer run. Since, however, these concern only the surface, for the most part only the methods, of the work of the leaders, the older problems necessarily come to the fore. Every indication points to the fact that those pillars on which the work of the leaders rests are not sufficiently solid, that theoretical uncertainty is particularly conspicuous.

These days everyone accepts--at least I think they do--the evidence that the effectiveness of the work of an organization is in decisive measure influenced by the level of leadership. Most significantly, this is demonstrated by the examples of economic organizations, where the interconnection between effectiveness and the efficacy of the leadership is most directly recognizable. And if we examine thoroughly the many, many components of effective economic leadership, we may find there the experience of the leaders, a modern leadership viewpoint, as well as the knowledge of the leaders, the theoretical grounding of the leaders' work, etc. Why would this be otherwise in the party organizations?

Within the framework of a single article it is naturally not possible to set forth in detail the "theoretical foundations" of the leader's work, but by offering some viewpoints perhaps we may reinforce a kind of attitude that would be desirable in the leadership of the party organizations in our day.



One such viewpoint is that every primary party organization leader should increasingly realize in the deepest way possible that he does his work as a leader in a particular area, in the field of political life; he is himself a political leader. This characteristic feature of the operational area, that is to say, must be felt in the attitude, content, methods, means, the whole style of activity of the leader. More concretely this means that the whole leadership concept, work, and behavior of office holders working in the party should be guided by the fact that the political area is the terrain of the meeting, clash, compromising of interests. In particular, it is a question of the kind of interests that must be examined as a function of the interests of social strata and classes, indeed of the whole society. It is not by accident that it is usually said that politics is the art, indeed we may also add, the science, of compromising interests, when antagonistic conflicts of interest, class antagonisms have disappeared among such relations. It follows from this that the political leader must approach the problems that come up primarily from the perspective of interests. With regard to the fact that the party organization functions as a very complex social and economic agent, in the thousand-stranded system of human relations, this of course is not simple. Since in the everyday course of things very many problems come to light, he must first of all decide whether it is necessary to deal with a given matter at all, or not. That is, does it affect the various interests to such an extent that the political nature of this question can be felt out? He must know at the same time that certain issues only very rarely manifest themselves by clearly indicating their political essence, just as so-called clearly "professional" problems are also relatively rare.

It is necessary to emphasize this, because it may be observed that in practice the party organizations take charge of every problem "indiscriminately," even the kind whose resolution is politically, legally, dependably regulated and guaranteed by a statutory provision based on a political decision of more general validity, or by an economic regulator. I repeat, politically --therefore taking into consideration the various interests. I think that if this condition is given, then we have already discovered one set of the kind of problems with which the party organizations and the political leadership must deal only when a deviation from a political decision of more general validity presents itself. Why must the leaderships of the primary party organizations, during the course of the exercise of their opinion-giving sphere of authority, become involved in deciding various personal matters in an apolitical way at a time when that is the well-regulated sphere of authority of the state or economic leader, instead of keeping an eye on the political tendencies of personnel work, and influencing it in a direction that accords with the principles of cadre policy? Or why do they take a hand in the resolution of individual wage questions instead of dealing more efficaciously with the enforcement under the given circumstances of the principles of the socialist wage system? Partly, I believe, because we start from that otherwise not objectionable notion that the party's political competence extends to every question. But the individual personnel matter, the individual wage question, is not yet a political matter. On the other hand, those reflexes are operating according to which "the party must know about everything," "it must have its say heard in every matter that qualifies

as more important," and paralleling this there is a misconstrued, over-extensive assumption of responsibility, as well. It is not difficult to see that among present-day relations not even a single party organization is capable of political involvement so conceived, but there is not in fact any need for this.

A tendency in contradiction with this is also observable in political practice. There is the kind of political leader who "consciously chooses," classifying individual problems into a political or professional category, and referring the latter to the sphere of authority of the professional leaders. It is true that in a given period or among the relations of a system of inter-connection many matters have no political character or a negligible one; or it is precisely the professional--economic, technical legal, administrative--relationships that conceal the political essence, seeming to offer the rationality of choice. All at once it must be observed, however, that problems adjudged "professional" have turned into very difficult political affairs. In a plant, for example, the organization of the work is a professional--engineer's, technicians, foreman's--task, not a political matter, but if shortcomings assume such proportions that the normal course of work is impeded, it becomes a political problem.

The mechanical division of problems into questions of a political and a professional character--besides the fact that it is erroneous, for among given social relations every problem may of necessity have political ramifications--dulls that necessary political sensitivity, by which, if we possess it, we can recognize the development of the political elements of each matter of concern. It is not proper therefore to categorize questions in this way out of some kind of "clever foresight," because in the meantime their political weight may increase to such an extent that their resolution exceeds our capabilities. Nor is it to be regretted if every now and then so-called clearly professional questions come to the table at a political forum; at the most we should point out that the political significance of the matter is negligible and we should put it aside.

A further issue is the discovery of the political significance, gravity, extent of the given problem. This, that is to say, determines the import of dealing with it, the amount of energy to be devoted to it. Political sensitivity and experience have a large role in the recognition of this, but we also possess objective bases as well, in particular, those decisions, determinations, expressing the interests of the whole society, in which the strategy of political activity appears. For this very reason, when the political leader goes to work on resolving the questions that arise, when he examines how and to what extent he must handle them, how they should be classified, then, alongside a thorough investigation of local interest relations, he should also carry out a kind of "retrospective accounting" as well, he should try to establish in what way the given problem directly concerns him, or through what kind of transmissions it is connected to the social accomplishments that have been achieved, and should do the same thing in advance as well, comparing it as well to the most fundamental social goals and efforts. The more direct the connection of the given problem to fundamental interests already implemented, as well as those that can be

implemented, and that also appears in a political form, the greater its political gravity, the more prominent place it occupies in the rank order of tasks to be performed.

This fundamental position must determine the political leader's place, role, relation to processes moving turbulently in his functional area, and the content of his entire activity. This way of thinking makes his work more purposeful, dependably circumscribes the bounds of his competence, lessens superfluous parallelisms, protects him from politically "idling in neutral" and from wasting his energies as leader.

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In the foregoing I emphasized the special quality, the political character, of party leadership; now I emphasize that the general rules of leadership are also valid. The role of general regulator is filled by the principles of socialist leadership, which do not offer a complete guarantee of successful work as a leader, but whose operationalization increases the security of leadership and may raise its level, its efficacy.

The socialist principles of leadership follow from the essence of socialism itself; practice validates their correctness. These are for the most part well-known rules; the literature of socialist leadership, various textbooks and studies individually or in some kind of arrangement, discuss these in whole or in part. Namely: the requirement in socialist leadership of unanimity of leadership, priority of politics, democratic centralism, collective leadership and personal responsibility, objectivity and concreteness, apprehension of the decisive link, party-mindedness of leadership, combining the social and the state principle, harmony of material and moral incentives, etc.

In my opinion, to the extent these principles appear recognized when thus enumerated, to that extent they are not to be found in the general consciousness of leaders, and still less do they have an impact in the practice of leaders. Leaders—even some political leaders—conceive of the starting of the work of leader or the increasing of its efficacy in such a way that they ascribe the preeminent role in it to methods, and therefore according to them they must become adept at the technique of leadership, they must learn the practical tricks of the trade, and thereby they have already done the most important thing.

I am not underrating the significance of leadership technique! What may be learned as a utilizable method by close observation of others, must be learned. But who disputes that there are at least two sources of acquiring familiarity, even as regards the work of a leader, namely, theory and practice together!

What may the reason be for the chasm between what is done at party forums and continuous everyday political work? Membership meetings and leadership sessions in general accord with the formal regulations, they designate the responsible parties in the decisions. It is also observable, on the other hand, that the decisions of the bodies are not suitably carried out; the secretary takes over certain tasks of those competent (responsible parties);



secretary takes over certain tasks of those competent (responsible parties); what is more, it also happens that he has to shoulder even the decision-making in certain operative questions. This is nothing else than the much-condemned, undesirable, "secretary centeredness." Besides the fact that this phenomenon also has objective causes, subjectively what is at issue is that the activity of the secretary--leader--is not suitably imbued with the principle of collective leadership and individual responsibility. Therefore the asynchrony of leadership principles and methods has a role in the coming into being of the chasm between what is done at forums and continuous political work.

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In economic practice it is now completely accepted, that it is possible to measure and rate the activity of an organization and the efficacy of leadership by results, by output. This is especially unambiguous when output is measurable in an exact way. In political work it is as if this concept has still not made suitably effective; at least there is a certain shilly-shallying in this regard.

Given the character of political work, it is never measurable in the same way as productive work, but why would this call into question the general rule that here too the measure of work is output?

In the management of the organization—for that matter, simultaneously—the leader is oriented, then rated, by several things, inter alia, by certain processes and events, by the fact that his work is with human relations, that he must have regard for human organizational relationships, and so on. But the chief viewpoint is after all that the organization entrusted to him should fulfill its task at the highest possible level. It appears to me that in the work of the party organizations, as well as in the judgment of them, this latter viewpoint is for some reason not adequately felt, at the very least it is not sufficiently emphatic in practice. That is, the work and leadership of the party organizations is not sufficiently output-centered.

Probably the reason for this is the special quality of political work, the difficulty of measuring it, but certainly the inexactness of the measure also. This means that the measure must be altered, because it is not at all certain that the political effectiveness of the party organizations may be measured by how many programs they have organized, whether these have corresponded to certain stipulations, or how great the "activity" was in there.

In the interest of effectiveness, what qualifies as a result in the work of the party organizations must be defined with the greatest possible exactitude. The starting point may be that the political organization must produce a political result. In the case of the party organization this may be construed to mean the extent to which it is capable of implementing in its own operational area the policy of the party, how capable it is of putting into force the leading role of the party. Formulated more simply, but more precisely: with what efficacy it solves political problems that are ripe for solution; how effective its above-indicated interest-compromising, interest-enforcing activity is. That is to say, approaching it another way: every positive change, which has come about during the course of political activity,



positive change, which has come about during the course of political activity, may be regarded as a result. When ascertaining effectiveness, the chief question is: what has changed? In a given question, by how much has the comprehension of the party membership become more unified, by how much has its readiness for action become stronger? To what extent has the political influence of the party organization grown, how many people has it succeeded in winning over to some cause or goal? As opposed to that concept existing even in present-day practice, which would be called event-centered instead of result-centered. Doubtless, political events, social programs, actions, all indicate movement; in themselves they carry the possibility of change. The fact that "we have discussed," "we have decided," may not yet be regarded as the end, the result, of political work, but at most only as its means.

Naturally, the measurement of the result even in this way will not be simple, because all that the party organization does is given import by its integration into the results of the economic, institutional, residential environment. But it is not indeed slow and leisurely measurement that is the essence here, but the increasing consciousness of results as the main orienter of leadership, the recognition and practical predominance of the fact that everything that the party organization and its leadership does is to be evaluated from the standpoint of its political efficacy.

If we think this way, the real goals will reveal themselves to us, activity and result will be comparable, success will become tangible and its political experience more pervasive, we may recognize worthless make-work more confidently, and perhaps we may successfully take up the fight against the two banes of political work, formalism and bureaucracy.

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POLITICS

POLAND

ELECTION PROCEDURES CLARIFIED

Vote Count, Results Described

Warsaw ZYCIE WARSZAWY in Polish 8 Oct 85 pp 1, 3

[Text] How and by whom will the results of the elections be counted; when will they be known? Answers to these questions, among others, posed by the journalist of PAP, were given by Barbara Enholc-Narzynska, Deputy Chairman of the State Electoral Commission, the director of the Bible Society in Warsaw.

[Question] Who will calculate the electoral results?

[Answer] First of all you have to distinguish between calculating the electoral results and the voting results. The process of calculating the voting results is conducted on two levels. First the members of the district electoral commissions count the votes cast in the respective districts, then the data from the districts are summed up by the members of the regional electoral commissions, at which point the stage of calculating the voting results ends. The official records from the regional commission are turned over to the State Electoral Commission, which then calculates the electoral results.

[Question] You say "the members of the commission," but who are these people?

[Answer] The members of the commission were chosen from among the electorate; they represent a broad political and socio-professional cross-section of the electorate. Over 188,000 people comprise the regional electorate commission. For the most part they are white-collar workers from various professions, especially teachers, agricultural personnel, and social workers in the administration of justice. The portion of workers ranges from 5 to 20 percent, of farmers, from 6 to 28 percent. In the commissions involved, there are also many representatives of different social groups--tradesmen, retired officers, and pensioners.

Among the section of socio-political members concerned are representatives of the PZPR and all political parties; the non-party proportion ranges from 22 to 40 percent. In the work of district electorate commissions participate many Catholic activists and those of other Christian creeds. Some of the

members of the commission have already participated in electoral work in the course of previous campaigns. Now their experience will be extraordinarily useful. The situation is similar in the case of regional and state electoral commissions. All together over 200,000 people will be involved in the process of calculating the election results.

[Question] How does the process of calculating the voting results look from a technical viewpoint?

[Answer] That's a rather complicated business. The calculation and officially recorded assignation of the voting results in the district starts immediately after the voting ends. All commission members take part in this work. First of all they count the number of people with the right to vote in the district on the basis of the register of the electorate, taking into consideration the people added to the register on the basis of testimonials. Next the commission, according to the procedure, keeps safe the voting cards that have not been used. Next in order is the opening of the ballot-box. The cards taken out of it constitute the sole basis for calculating the results of the voting.

[Question] Will these be the cards to be used both for voting for the Diet members from the regional as well as the state electorate register...

[Answer] Yes, they'll differ in color. The voting results for each of the registers will be calculated separately. First the commission calculates the voting results for the Diet members chosen from the regional electorate register. All the cards are counted precisely, thus specifying the number of people who turned in their voter's cards. The next step is to determine the number of votes cast in favor of specific candidates. The calculation is carried out on a special sheet. First the number of valid cards without crossings-out, thus without votes, is noted down on the tabulation sheet next to the surnames of the candidates located under position 1 of each of the seats. From the group of cards with crossings-out are separated those which are completely crossed out or those on which all the candidates' names have been crossed out. These are set aside, for though these votes are valid, they do not count for any of the candidates. Now the commission examines the valid cards that remain, counting the votes cast in favor of specific candidates who are contending for each of the seats. Each vote is recorded next to the candidate's surname on the tabulation sheet. If in the category of a seat one candidate has been crossed out, then the vote goes to the other candidate. Crossing out both candidates to a given seat results in not having the vote go to either one of them. Votes cast for each of the candidates, which are counted both from the cards with and without crossings-out, are then counted up and the number of them is recorded on the tabulation sheet next to each name.

The calculation of voting results in the district for seats chosen from the state electoral register is carried out similarly. The number of all the cards taken from the ballot-box, the number of invalid and valid cards, with crossings-out and without, are determined in an identical manner. In analyzing the valid voter cards containing the crossings-out, the commission

in turn counts the votes in favor of those candidates whose surnames have not been crossed out. Next, as in dealing with the regional registers, the official record is drawn up.

[Question] And what is the role of the regional electoral commission?

[Answer] The members of the regional electoral commission check the official information received from each district. Specifically it controls whether the candidates' names are written in the same way and order in which they are indicated on the voter cards. The commission members also check to see whether there are not written in more cast votes than the number authorized to vote and whether the total of valid and invalid votes equals the number of votes cast. Furthermore, in the official voting records for the regional electoral register, they check whether the total of votes received by both candidates for each of the seats is not greater than the number of valid votes. As it receives the official records from the individual districts, the commission notes down their receipt in the control list and then makes the appropriate entries in the tabulation sheets. After receiving all the official records from the districts, it totals the number of votes cast for individual candidates on the regional level.

[Question] In what way are official election records transferred?

[Answer] The presiding officers of the district electoral commission or their deputies send in sealed envelopes the official records officially approved by the representative of the regional electoral commission. The official record of the election prepared by the regional electoral commission is sent to the presiding officer or the deputy of the presiding officer of those commissions authorized by the representative of the State Electoral Commission. To ensure safe means of transportation for the transfer of electoral documents is one of the duties of the administrative organs.

[Question] In describing the process of tabulating the results of the election in the district you did not mention the marks placed by the commission members next to the names of the electorate when they are handed their voter card.

[Answer] That's right, for the marks don't have any connection with the tabulation of voting results. They are made so as to make it impossible for someone to vote more than once.

[Question] So we come to the last stage of tabulating the results, which takes place at the level of the State Electoral Commission.

[Answer] On the basis of the official records received from the districts, the State Electoral Commission tabulates the results of Sejm elections in specific districts from electoral registers as well as the state register. This is not just a mechanical tabulation. From the district register one can only consider elected those candidates who have received more than half the votes, and if in the voting have participated at least half of those authorized to do so in the electoral district. From the state register one can



consider elected only those candidates who have received more than half the valid votes and if in the voting have participated at least half of all those authorized to vote. The State Electoral Commission draws up the official record obtaining the results of elections to the Sejm. At all these procedures can be present and can formulate comments delegates of the All-Poland Electoral Convention.

Immediately after the end of the procedures the All-Poland Convention must inform the public about the results of the elections in the form of a public announcement in the press, on radio, and on television.

[Question] When will this be?

[Answer] Right now it's hard to specify how long it will take to finish the tabulation and make the results of the election known to the public. The State Electoral Commission will also have to take into consideration the results of the voting in the district established abroad and on Polish ships. The official records from abroad may be delayed, especially from Polish posts. Last year the results of the elections to the national councils were known after two days. It's hard to say whether our commissions will manage to tabulate the results that quickly. Anyway, hurrying is completely inadvisable here. What's most important isn't time, but honesty.

#### Validity of Votes Described

Warsaw RZECZPOSPOLITA in Polish 8 Oct 85 pp 1, 2

[Text] In voting for candidates from the regional electoral register the voter casts his vote for the number of candidates that must be chosen in a given electoral region according to the distribution of seats indicated on the voter card. The names of the candidates beside each set for which the voter casts his vote are not crossed out. The voter may (though he does not have to) cross out the other names. If on his voter card the voter leaves the names of both candidates to a single seat without crossing them out, then he is considered to have cast his vote in favor of the candidate listed first.

In voting for candidates from the state electoral register, on the other hand, the voter casts his vote in favor of those candidates whose name he does not cross out on the voter card. Votes are invalid if cast on voter cards other than those officially established or on cards not affixed with the seal of the proper electoral commission; or on cards completely torn into two or more pieces. If on the voter card other names are added or other notations are made, that has no legal consequences and does not influence the validity of the vote. A vote cast on a voter card which is completely crossed out is valid, but does not count for any of the candidates listed on it.

#### When a Candidate for Diet Membership Wins a Seat

Candidates for Diet membership are considered elected when they have received more than half the votes (50 percent plus one vote) and if in the voting have participated at least half of those authorized to vote in the electoral

region. From the state electoral register those candidates are analogously recognized as elected to Diet membership who have received more than half the valid votes (50 percent plus one vote) and in the voting have participated (taking the state as an electoral region) at least half of those authorized to do so.

#### Recall Procedure Noted

Warsaw RZECZPOSPOLITA in Polish 9 Oct 85 pp 1, 2

[Text] The electoral law to the PRL Sejm gives the electorate voters such a possibility. The electorate, in accordance with its regulations, may recall a Diet member if he (a) violates through his behavior the deputy's position (b) shirks fulfilling a deputy's duties and (c) betrays the electorate's trust in some other way.

The proposal to recall a deputy elected from the regional electoral register may be made by (a) the electorate of the electoral region in which the deputy was elected (b) the provincial authorities of the political or social organization which advanced his candidacy to Diet membership (c) State Council PRON. The proposal to recall a deputy should indicate the accusations brought against him as well as their grounds. For such a proposal to be valid, it must be supported by at least 10 percent of the voters from an electoral region authorized to vote on election day.

That is why both the proposal to recall a deputy, as well as making support of the proposal by the electorate possible, demand that this take place at meetings of a political or social organization, at meetings of urban and village administrations, meetings of working plants personnel. Each such meeting must be officially recorded, and in the official record the number of voters attending must be stated, as must also be the number of voters supporting the proposal.

The Sejm, after considering the proposal, may pass the resolution about the application of the electorate to recall the deputy. As soon as such a resolution is passed, the deputational activity of the deputy whom the proposal concerns is suspended.

The State Council administers voting in the matter of recalling a deputy. This takes place in the area of the electoral region in which the deputy was elected, on a day that is a legal holiday, within 3 months of the resolution passed by the Sejm.

Voting in the case of recalling a deputy, on the basis of the regulations of the Electoral law to the Sejm of the PRL, takes place once. The deputy is recalled if the majority of the electorate participating in the voting are in favor of the recall. The Sejm confirms the validity of the deputy's recall, and thus the validity of the election results.

17 January 1986

(a) The electorate from any electoral region and (b) the State Council PRON can present to the Sejm the proposal to recall the elected deputy from the state electoral register.

The proposal of an electorate from any electoral region, before it is presented to the Sejm, must have an opinion passed on it by the State Council PRON. That means that in order for it to be considered positively by the Sejm, it has to be accepted by the State Council PRON.

The procedure for setting in motion a proposal to recall a deputy chosen from the state electoral register by the electorate of any electoral region is the same as that which operates for recalling a deputy elected from the regional electoral register. The Sejm, after considering the proposal, may pass a resolution in the matter of recalling a deputy, specifying the procedures for recalling him.

#### Socio-Political Breakdown of Candidates

Warsaw RZECPOSPOLITA In Polish 9 Oct 85 pp 1, 2

[Text] Final registers of candidates who on 13 October will be running for seats in the Diet are announced for public information. There are 870 candidates, of which 820 are on the regional, and 50 on the state electoral registers. Those appointed from a group of close to 2000 members were citizens registered to electoral conventions by political parties, PRON, and public organizations.

Who are the candidates? First of all one must stress that among them are found representatives of all social classes and groups. Over two-thirds are workers and peasants, and thus the representatives of the dominant social class in our country. Their participation in parliamentary matters attests to the class-structured nature of the country, its concerns that the Sejm be the closest possible to the interests of the working people, worker and peasant opinions, views, and aspirations. Experience teaches that it is precisely the deputies--the workers and the peasantry, who work directly in production, who maintain steady contact with co-workers, with the business personnel, and are inspired by these connections to parliamentary work--who are in a position to present their opinion most effectively. They are the ones to influence the harmony between the Sejm's decisions and the public's expectations.

Among the candidates, professional unions are broadly represented. Sixty-eight activists from the professional movement are candidates. There are also work people among them who will represent on the Sejm forum a larger group of unionists, thus those people who directly concern themselves with the conditions of life and work of the workers. Among the candidates are representatives of trades. There are also activists from workers' administration, farming and social administration, and thus from all organizations and institutions that represent the sphere of work.

The number of young candidates for deputy posts is also significant. There are over 100 of them. This emphatically evidences the fact that young

people's affairs at the ninth Sejm will have in office their own direct representatives and spokesmen. One hundred and thirty two non-party candidates, however, are clear proof that the next Sejm will be representative, that it will serve the further development of national understanding.

As the experiences of past tenure in the Sejm showed, a group of specialists from various milieus ought to be included in its make-up: people who know how to handle themselves competently in the sphere of complicated legislative or economic problems. Among the candidates are many distinguished scientists, lawyers, economists, and engineers who are in a position to cope with the difficult problem facing parliament.

It is important that 88 former deputies are also candidates in the elections. That is merely 20 percent of the make-up of parliament, probably the smallest percentage of postwar elections. The new election has as its goal the bringing of their experience, their familiarity with the functioning of parliament, to the work of the Sejm. They will also, which is more vital, guarantee the continuation of the manner of operation and style of parliament's eighth term of office.

The social make-up of the candidates for deputies fully reflects the social structure of our country. Accordingly, represented among them are the most important classes and social strata, of which the nucleus are the workers and the peasants. This provides a good guarantee that the Sejm elected on 13 October will fulfill its governmental function and the hopes the public has invested in it.

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POLITICS

POLAND

OSMANCZYK RECALLS SEJM CAREER, URGES TOLERATION OF OPPOSITION

Wroclaw ODRA in Polish No 9, Sep 85 pp 15-20

[Interview with Edward J. Osmanczyk by Jerzy Szperkowicz]

[Text] At the outset, I must explain to the readers of ODRA the reason why I am one of the oldest deputies in our parliament, the oldest among the non-party deputies, and the deputy from the Oder region since those gloomy stalinist days of 1951. I began my duties in Szczecin, and have been a member of parliament from my native Opole since 1957, with a break from 1961 to 1969 when I was in Latin America. In fact in 1951, following a stint as a correspondent in West Berlin, Germany where the Allied Press had its headquarters, I moved to Szczecin. At that time threats of seizing Szczecin away from Poland were being repeated. Never since Potsdam did I believe in any possibility of a change in the Oder-Neisse border. I had views similar to those of Jozef Kokot in today's already classic "Potsdam Logic." All the same, I believe that as a native from the Oder region I should give testimony to this belief by settling in Szczecin.

A few months later I was traveling from Szczecin to Warsaw on purely personal business. I settled down in my sleeping compartment, the train was to leave momentarily. Suddenly, I heard a knock. Two men in uniform requested that I dress and follow them. In those days this was not unusual. In dressing I put on two shirts and two pairs of trousers. A car was waiting in front of the station. When we passed, without stopping, the Prussian edifice very familiar to all Szczecin residents, I was very surprised but said nothing. We arrived at the Provincial Committee headquarters and I was led into the office of the first secretary, who at that time was a respectable activist from the socialist circle. My escort informed him: "We have brought him." The secretary became perturbed and sent them out immediately, he then began apologizing profusely and noted that he found himself in an unusual predicament. He was to offer me a position as a deputy and did not know how to do it after such an unpleasant incident. I responded that notwithstanding the incident my answer would have been an emphatic "no". He then suggested a walk, unfolding his arms and pointing to the walls. In the park he used the argument that deputies to the People's Council in Poland from the Union of Poles in Germany connected with the PPS [Polish Socialist Party] or the Peasant Party, had been excluded from running for the Sejm. The youngest member of the union, Araka Bozek, was seriously ill. If I as a non-party

person did not agree to run, then people from "Rodlo" would not have a representative in the Sejm, and "Very hard times have arrived." People from "Rodlo" will continue to be accused of nationalistic tendencies, and who will defend them? This convinced me. In this manner I became a deputy from Szczecin, and in 1957 my native Opole began to lay claim to me. Since that time, I am in the third decade of using the title deputy from Opole, and I believe that I will continue to represent it. I feel obligated to represent my native region in the Sejm, representing the people from "Rodlo" who have experienced very dramatic changes in fate after the war. I also believe that I have a right to represent these citizens' thoughts, which I also express in my journalistic activity beginning with "Polish Affairs."

[Question] Did you ever and especially during your first term regret that you listened to the unofficial argument of that official in Szczecin?

[Answer] Never. In fact quite the contrary. I believe that the proper advice was given by the elder activist to me the younger one, despite the basically different points of view. We certainly agreed upon one thing, and that was that we had to survive the bad times. Even while I was in Berlin I had been aware that my region has also been affected by this, and was advised not to return. Many of those who later escaped predicted that a cactus would grow on their palms were the author of "Polish Affairs" to return to Poland. I knew that my closest friend from the war years, Arka Bozek, was seriously ill, having been greatly tormented, suspected and humiliated, and had lost the will to live. I was aware of the tragedy which our area was then greatly suffering through, specifically the arrest of Janina Klopocka, the author of the "Rodlo". From December 1949 to December 1951 we did not know what happened to her, no news nor any trace. For 2 years she was kept in the underground area of Koszykowa and interrogated at night to force her to confess that she had been a courier between the Gestapo and the Home Army headquarters. During the day she was forced to peel potatoes. This heroic woman, one of the fine participants of the opposition movement in occupied Warsaw, enamoured of the delicate strokes of Durer, was an excellent artist. When she was taken for another two years to Mokotow, her hands were no longer in any condition to draw, etch in copper or wood as before. That which she could have created in the Polish People's Republic would never be. After many years, she finally lived to see a working exhibit in Warsaw from 1 July to 15 August 1985 (at the Royal Palace), and exhibited earlier in Krakow, Wroclaw, Opole, and Przemyśl. I recall all this not for purposes of vindictiveness (who would one avenge oneself upon?) but rather to make the readers of ODRA, especially the young ones, aware of the times in which I began my non-party service from the Oder region.

[Question] How would you define your philosophy as a deputy?

[Answer] My philosophy is simple. I represent the state, "L'Etat c'est moi!" Every citizen has the right to repeat this where feudalism has ended. I accept the fact that since feudalism no longer exists here and democracy somehow manages to hobble along, it is necessary to utilize the maximum for

the development and intensification of democracy which is a well-known instrument, and which our parliament can become. But only under the condition that it will be elected.

The elections impose the selection of deputies not by reason of a reward for some of their achievements but rather in accordance with their usefulness to the Sejm. This is a very basic issue. If political parties know that whoever they put forth will be elected, then the position of deputy becomes a reward and not a responsible civic duty.

Despite the rich Polish parliamentary traditions, both good and bad, of course, I believe that there are more good than bad ones, our parliamentary democracy developed only during periods of upheaval. If we were to accept Sejm reports, we would notice how following each upheaval an interesting parliamentary eloquence flowered. Suddenly, we hear new and sensible things from the forum. On the other hand, when there is stabilization to lesser or greater degree, discussion immediately ceases, individuals become speechless, and arms as before are raised like grain. I am an optimistic realist, pleased even with a bit of progress in big matters, have come to like the candid opinion concerning the electoral law voiced by Kazimierz Barcikowski: "We have again gone one step forward. Of course, this is not that which was customary since 1951, the year 1985 rules out a 99 percent approval rate, since today no one will believe in such a thing, and in addition the current electoral law demands that the winner receive 50 percent plus one vote. Earlier, it was possible to obtain 1 percent of the votes and still become a deputy (in the case of a so-called unmandated seat). In addition, the entirely new approved law concerning deputy obligations and privileges places the crosspiece of obligations so high that it must frighten away many candidates accustomed to treating the position of deputy as a privilege. Finally, in my opinion, yet another even great step among small ones is the intentional or intrusive carrying out of the Sejm elections before the congress of the Communist Party governing our nation. To date, the Sejm had a program which came about from the program adopted at the PZPR Congress, with the majority make up of the Sejm constituted by PZPR deputies, resulting from the composition of the new Central Committee. In this situation, deputies will most certainly be chosen by virtue of their usefulness to the Sejm's functioning, since the results of secret balloting at the congress are unpredictable. Incidentally, I regret that the electoral law did not include my proposal that secret balloting also be obligatory in Sejm elections.

[Question] You speak unwittingly of the election of deputies, while of course thinking about candidate members.

[Answer] I speak of the actual new Sejm members within the real context of 1985. In my opinion, the majority in the new Sejm should represent those generations born in the Polish People's Republic and this is closely related to the specifics of the Oder and Baltic regions. During the elections of 5 years ago, it was forgotten that by 1980 the Polish People's Republic had already existed for 35 years. Those born after the war had already long ago reached the legal voting age. While those born during the war who had not joined the ZMP [Polish Youth Union] were approaching 40. Their

representatives found themselves in the Sejm in small numbers, since the majority of the seats fell to the gray-haired elderly youth organizations.

[Question] You also had reservations concerning the territorial composition of the Sejm to date?

[Answer] Yes. I consider the serious defects of previous terms to be the narrowmindedness of the Warsaw headquarters and the inability to notice the great changes taking place primarily in the West from the Vistula to the Oder. The number of deputies born in the northern and western territories was as a rule insignificant. Often it was possible to count us on one hand. At the same time, the majority of the handful was born in these areas before the second and even the first world war. These disproportions, both in age and regional representation are currently creating a very serious problem for all political groups represented in our Sejm. The proportions of the changes are shockingly obvious. Normally, two-thirds of the current deputies run for office for the next term, while one-third are subject to replacement. In this case, at least two-thirds must leave office. We continue to have a unicameral parliament. Its future appears to represent an equation with at least two unknowns, namely who will be the deputies in the majority, deprived of the critical experiences of previous terms, as well as in what atmosphere and among what realities will they obtain their training as deputies. In my opinion, the next 4 years will be very difficult years, at the same time deciding our future and specifically the next 100 years. The question has been raised on whether or not we will be able to get through the economically and socially extremely difficult upcoming years without social upheavals. Without new social upheavals, without new internal conflicts, and new international incidents. Let us realize outright that the world has no patience for our misfortunes. Neither the East nor the West. Both have much more important problems. In any case, this reminds me of an old pre-war anecdote. During the Great Depression, a poor man was standing in a New York synagogue beside two very wealthy and dignified orthodox Jews in rich looking fur-lined coats. In accordance with the custom he prayed louder with the ever increasing importance of the prayer. He prayed: "God give me \$100 and I will be able to get my wife out of the hospital, pay me debts, and still have some left over for that deal I want to make with Abramowicz, and all my problems will be solved." The two dignified rich men began to look at the wailing man with great impatience. All of a sudden, they exchanged glances and each took out a \$50 bill saying "Go away, don't you see that people here are praying about more important matters." Consequently, I am not such an optimist as to believe that the East and the West will give us these \$50 bills so that they can occupy themselves with their own problems. On the other hand, I suspect that they will leave us alone so that we can take care of our problems ourselves. They have other issues to resolve besides that of Star Wars. Both are apprehensive about the disparity between the northern and southern hemispheres of the world. Before the end of the century, the proportionate population of the industrialized nations to that of the Third World nations will be 1:4 or even 1:5. At least 4 billion people will be demanding economic, public, cultural, and informational assistance from the industrialized northern hemisphere. The industrialized world, which to date has been involved in world power squabbles and interbloc contests in the world



of hunger, poverty and backwardness, in my opinion, is sentenced to undertake rapid cooperative efforts at solving the global problems, specifically the demographic, ecologic, and social ones. In this respect not enough attention will be devoted to the Polish cause and unrelated matters. By the end of the 20th century those unrelated matters will be associated exclusively with the affairs of the Third World. We must realize this. In view of this, the composition of the Sejm will become more important than for just this one term. It is extremely crucial that the Sejm be composed of wise and courageous persons, capable of helping society in surviving these difficult years which we have before us. I consider the use of unmarked ballots for voting as one of Gomulka's greatest sins. At that time, a new tradition for Sejm democracy could have been born, and served as a basis for society in successive times of trial. Today, after 30 years we would be much further along with our parliamentarism. However, we should continue even more to take advantage of the far from perfect parliament since it can be improved. Without basic reforms of the People's Republic, beginning with its major institutions, Poland will decline in Europe to the level of the nations of the Fourth World, that is those which slip back in development.

[Question] In Sejm accounts in the reader's minds were you most certainly labeled as a supporter of the hardening of the Polish zloty and softening of passport access. Why have you given priority to these two matters?

[Answer] Because I do not know of a more successful economic lever for Poland than a monetary improvement and the demythologization of emigration. Speaking in slogans: "A hard zloty and a passport in the desk." The first matter is after all very much related to the second. We constantly fail to evaluate the economic aspects of the country's ties with the emigres. Thoughts about emigration in terms of "Mr Balcer in Brazil," nostalgia, Cepelia dolls, have been experienced in the current revolutionary period of population mobility. Many nationalities have already relinquished the notion of emigration for temporary visits abroad by their citizens. The classic example of emigration is still maintained in the Third World nations, where it represents economic escape from primitive poverty to civilized inadequacy. Modern societies have no pretensions to the fact that someone who has the opportunity to make money in Hong Kong or Pernambuco takes his passport out of a drawer, leaves, and makes his money. Later, he returns and invests the money at home. In turn, those who have settled abroad permanently willingly carry on business with their native country because of the benefits they receive, in comparison with foreigners, such as knowledge of the language, customs, family ties, and friends. In business the most important thing is trust in one's partners and customers. It is always easier to trust one's family and friends rather than total strangers. The Scandinavians and Italians realize this early on. For 40 years now the Yugoslavs have been doing good business in this area, since their system is more similar to that of Poland than Italy.

[Question] We are discussing the changes occurring in the world. What changes would you consider as historically most significant in postwar Poland?

[Answer] I have devoted much space to this matter in my book "The Vistula and Krakow Represent the Rodlo." I intend to sacrifice the rest of my life to it.

Of course, I think about the historic consequences of Poland's return to the Oder-Neisse border. As Pawel Jasienica said to his group of Krakow friends in 1945: "Poland's Jagellonian epoch has drawn to a close, now the concept of Piast Poland has been achieved and it will bestow direction upon our efforts." This perceptive masculine analysis brings much pride to a great writer. If before 1939 Poland gravitated toward Wilno, Lwow, and even further, today Poland east of the Vistula has ceased to play a dominant role in our economy, politics, and demography. The point of contention in all these areas, including culture, has moved to the left bank of the Vistula.

[Question] Krakow was there at all times?

[Answer] Of course. But only with the construction of Nowa Huta was Krakow linked economically with Silesia. Jan Dlugosz's dreams concerning such a union were fulfilled. A strip of special economic activism reaches to Opole, Wroclaw, and even as far as Legnica and Lublin. In the north, a second clamp is constituted by the ports of the Tri-City area, together with our harbor of Szczecin. If one adds to this the tendency of Lodz and Poznan to gravitate in the direction of Zielona Gora and Kostrzyn it will become obvious that the shifting of the economic burden to the west of the Vistula has the character of a geopolitical revolution. I do not only speak of industrial development. The northern and western territories, which constitute approximately one-third of our land, supply only one-half of the grain we harvest. Opole Province supplies more grain than the 17 provinces on the bottom of the list. Together with this, the harvesting in Bydgoszcz, Poznan, Kalisz, Sieradz, Kujawy, and Lowicz demonstrates the growth in importance of the lands to the west of the Vistula in feeding the country. Let us now deal with the demographic factor. In addition to the repatriated and reemigrating masses, the most enterprising element from so-called Central Poland was also unloaded in the northern and western territories. A mixture of genes, cultures, and experiences resulted in valuable standards and brought great talent and individuality. Separated from 1951-1985 by reports of obstacles, the capital did not drain the province of its brightest and most ambitious individualistic youth, as generally occurs in the world. Thanks to this, energetic cultural, scientific, and technical centers have been established in Wroclaw, Gdansk, Szczecin, Opole, Gliwice, and Olsztyn. It is no accident that all great social revolutions which have started in Poznan have spread to the west of the Vistula. It will remain the same in the future. In every respect, the lands to the west of the Vistula have become dominant in Poland. Churchill's misgivings that "The Polish goose will choke on the excessively large land recompensation," turned out to be in vain.

Today, the ranking of the western and northern lands in the functioning of the Polish state not only represents an important matter for Poles but also in the international context. In January 1947, Poland had a population of approximately 24 million, the future German Democratic People's Republic had over 20 million. Currently, the population of our country is 38 million, and 16.5 million citizens in East Germany. In central Europe we represent the largest group in terms of population and economics. Before the war, the recovered territories constituted a rear area for the Third Reich's war preparations. Today, this represents a region linked with the Vistula Rodlo in

a manner which is decisive in the peaceful development of all of Poland. The role of these areas as stabilizers grows in the European context, and in the present-day world this means as much as the world situation. The 8 million young Poles born in this region equal the population of the area in 1939, and represent a guarantee for peace in this part of Europe. This is obvious.

In addition, together with the Polish population growth near the Oder and the Baltic and Lyna, the Vatican has started to regulate the local episcopates. The first statue of John XXIII, in the world, was erected in Wroclaw for no apparent reason, and this also contributed to the stabilization of Central Europe. In Poland it strengthens the world outlook on pluralism, which in our history has a long-standing tradition, and in the divided world it excludes fanaticism and intolerance.

Jagellonian Poland was composed of many nationalities and was multicultural, in other words pluralistic in nature. Piast Poland, in my opinion, is unfortunately poorer in the multicultural aspects of our former co-citizens. Only our long-standing pluralistic tradition, tolerance, and respect for the law, customs, and distinct character of our nationalities can save us from Polish self-satisfaction, presumptuousness, and arrogance. If we can achieve this, by defeating our foolishness, in the first half of the 21st century, we will lead Poland to a new Renaissance, and who knows it may be better than that of the 16th century. I hold every enterprise to this, and half of the victory will belong to the editorial staff of ODRA.

We will hold them to their word.

**\*\*The Rodlo represents the symbol of Silesian Poles.\*\***

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POLITICS

POLAND

#### FOLLOW-UP ON INTELLIGENTSIA ROLE IN PZPR, SOCIETY

Warsaw TRYBUNA LUDU in Polish 2 Aug 85 pp 1, 2

[Text] On 1 August there was a meeting of the Resolutions and Proposals Commission established by the 19th Session of the PZPR Central Committee. The chairman of the meeting was Jozef Czyrek, a Politburo member and PZPR secretary.

The commission discussed a project plan to implement the session's resolutions. The work was done in cooperation with state institutions, along with the active engagement of the intelligentsia.

During the discussions among the members of the commission, and in agreement with the 19th session's resolutions, the projects would be implemented entirely in accordance with the 11th, 16th, and 19th sessions. The resolutions recognize the role of the intelligentsia in resolution of problems and the scientific-technical resolution will require the complete engagement of the intelligentsia in order to utilize its creative talents for the future of the country.

Preparation of the resolution from the 19th session is a difficult task because the intelligentsia requires good working conditions and improvement of these conditions is tied to improvement of the economy and increased output for financial improvement.

As discussed at the session, the salary structure should be tied to initiative, talent, and innovation. It also was recommended that future personnel matters be based upon higher education and implementation of political principles.

During the meeting, seven working groups were created among the intelligentsia and the ministries to prepare an implementation plan stressing the various views and needs of the participants. The commission will continue to work with these working groups on development of the plan. The entire program will be presented to the Central Committee at its 22d session dedicated to the issue of national education during the fourth quarter of this year.

The Resolutions and Proposals Commission created at the 19th Session of the Central Committee had its third meeting. As was the case at the previous meetings, the discussion was lively and concerned that no work be wasted from the sessions.



The project was met with different perceptions. Some members of the meeting demanded that a certain number of concrete proposals be specified. This way the implementation of planned activities could be tracked more clearly.

More work will take place on the project. Five teams were engaged in the subjects of science and the economy, higher education, culture and mass information, health organization, state administration, and legal affairs. The purpose is to create a document for implementation that will make the best use of the nation's intellectual potential.

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POLITICS

POLAND

# IN DEFENSE OF ORTHODOX THEORIES OF SOCIALIST STATE

Warsaw NOWE DROGI in Polish No 7, Jul 85 pp 129-132

[Article by Boguslaw Ponikowski]

[Text] Lenin always emphasized that the issue of the state is one of the most complicated and difficult, and at the same time one of the most tangled by bourgeois ideologists (scientists, politicians, philosophers, etc.). At his lecture delivered at Swierdlow University, Lenin pointed out that state theory reflected "a constant struggle among various classes, a struggle that has reflected or found expression in the struggle of views on the state, its role and meaning. (Footnote 1) (W. Lenin: "About the State" in "Works," Vol 29, Warsaw 1956, p 469) This argument has an important methodological meaning for Marxist analysis of state matters and also on the divergent views on the subject of the socialist state.

There is no doubt that defense and development of Marxist-Leninist theory of the socialist state has taken on an expanded meaning. Unfortunately, our Polish Marxist literature on this subject is very poor. On a considerable scale, it is under the influence of bourgeois national legal ideology.

Experiences gained during the recent crisis have shown us once again the need for theoretical discussions on the issue of the socialist state. The main task of this discussion is to restore to our social sciences Marxist-Leninist theory about the state in general and the dictatorship of the proletariat in particular. This task is very important because the next session of the party will be developing a perspective program on building socialism, an issue upon which the state must clearly elucidate its view.

Within the framework of this discussion, an article by Stanislaw Rainko entitled "About the Peculiarities of the Socialist State" (NOWE DROGI, 1985, No 2) came forward. Two issues were discussed: (1) the role of the socialist in economic life, and (2) the decline of the socialist state.

Many statements by Rainko are controversial, double-meaning, and doubtful. This is partially attributed to the fact that they have been introduced in an abbreviated way. Let us start from the first "peculiarity," which according to Rainko is tied to the responsibility of the socialist state for the economy. The direct result of this is to broaden the structure of the state's apparatus

with the economic apparatus. From what Rainko writes, it would seem that the difference between the socialist and the capitalist states depends on organizational structure. In the composition of the socialist state, along with the traditional systems, such as the repressive apparatus, the political and ideological apparatus enter into the economic apparatus. But do we really have here the peculiarity of the socialist state? As Lenin already stated in his study about imperialism, the increasing economic function of the state is a natural step in class struggle.

Correctly, Rainko makes the strong statement, probably having in mind that the prating of our intellectuals on the benefit of "market socialism" and democratic "political pluralism," that the main attribute of the socialist economy is a plan which is emerging and which can be implemented at the present stage by the intervention of socialist state organs. Resulting from this is the grave political issue of the method of organizing socialist planning and its ramifications for state functioning. The matter becomes even more complicated when we consider that in the period of transition to socialism, trade laws are active and may be used to advantage in a planned economy.

The active role of the socialist state in every sphere of the economy does not shake the main positions of historical materialism nor does it justify the view more or less openly represented by many of our theoreticians about the non-adaptability of their analyses to the reality of the socialist countries. This does not concern only the principle on determination of a political superstructure through an economic base, but also the principle on the class warfare. However, to understand the character of this role, it is not enough to recall the known statement by Engels regarding the reversible influence of political power on economic development and relative state independence, but it is necessary to comprehend the view formulated by Lenin regarding the economy in the period of transfer from socialism to communism.

According to Rainko, a peculiarity of the socialist state is that it bears the entire responsibility for the economy and its development. "This responsibility," he writes, "is not comparable to anything known in history, and the socialist state cannot circumvent or free itself as long as it plans to keep the status of a state." (p 43) Having stated this, we have to understand completely the status of the state after the period of passing into communism. These are the same economic causes of the class structure. In Rainko's view, we can see Hegel's state idea as an autonomous subject of historical process. This may be at least the conclusion suggested when we read something like "the state cannot lay claim to...."

In another place he states that "the state is not a material object nor a technical apparatus." But now the question arises: What is the state? The argument that the state is the main element of the political superstructure does not answer the question. According to this, the state is not an object and its apparatus is not a technical apparatus. This is not proof that the state has a will, brain or thinks, feels and therefore has responsibilities. Neither is it an epiphenomenon. The created state apparatus has its own material nature. Within themselves, they do not constitute the state, but they

become the state because they are organs of state authority, which is always the authority organized by the force of prevailing economic classes.

The founders of Marxism oppose any idealistic state image. They always emphasize that the state is a special machine or tool of the prevailing class. In this sense, it cannot be treated as a social organization. Most concisely stated, the state is a class dictatorship. The same is the case for the socialist state. From the beginning to the end, it is a dictatorship of the proletariat. As we know, there is a theoretical dispute among Marxists about the definition of the essence of the state. This mirrors the existing ideological divergences in the contemporary communist movement, which have their source in the practice of class struggle, and above all in the contradictions bound up with the development and functioning of the socialist state on the one hand and the capitalist state on the other.

In these disputes, the scientific (in the Marxist meaning of the word) character of the proletarian dictatorship is very often forgotten. In Marxist-Leninist science of the socialist state, it fulfills the same role as the added value in political economy, power in physics, etc. Any consideration of the peculiarity of the socialist state becomes plain speculation if somehow it diminishes the central value of this category. I feel that today Lenin's words in "The State and Revolution" remain fully applicable: "The one who has adapted himself only to the essence of the state's Marxist science, who has understood that the dictatorship of one class is a necessity not only for the proletariat, which has liquidated the bourgeoisie, but also for the entire historical period dividing capitalism from 'the classless society' of communism..." "The passage from capitalism to communism," Lenin emphasized, "must, of course, produce a great number and variety of political forms, but the essence of things will be always the same: the dictatorship of the proletariat." (Footnote 2) (W. Lenin, "The State and Revolution," "Works," Vol 25, Warsaw 1951, p 444) In another place in this work, Lenin stated that the essential authority of the proletariat is 'centralize the organization of power and force.' (Footnote 3) (Ibid., p 434)

Very often even today there are attempts to "make history" of those statements and interpret them as conditioned by some special circumstances; i.e., civil war, obscurantism, etc. In this manner, there are also questions about the notion of the proletarian dictatorship as the central category of Marxist-Leninist socialist theory, and what is more important, it is treated as an expression of a passing state after usurpation of power by the working class. Here is one of the newest examples of this type of interpretation in our literature:

In an academic textbook written by Artur Bodnar, "Study of Politics," we read: "The proletarian dictatorship gives the qualitative aspect of socialist state activity, especially in the early period of its existence, depending on the shaping of class-level relations within society in such a way that antagonistic conflicts disappear, followed by a new social structure that is adequate to the new regime." Following this is the statement that "many misconceptions have grown up around the concept of the 'proletarian dictatorship' because of various ways of interpreting its scope," in order to scientifically discover



the existence of "many ways of denoting the term 'dictatorship of the proletariat,' which is bound to the statement that "there are many chronological criteria and various methods of political activity." This leads to the conclusion that can be broken down into three ideas on the dictatorship of the proletariat: 1) "the political regime comes to power after a period of direct struggle for power after the socialist political revolution"; 2) political domination of the proletariat and its allies vis-a-vis antagonistic strengths with which they are in conflict"; and 3) "leading role of the workers' party vis-a-vis the socialist state." (Footnote 4) ("Study of Politics," Warsaw, 1984, p 93)

It is difficult to say whether we have here more common ignorance, or vulgarization of the Marxist-Leninist theory of the dictatorship of the proletariat. Maybe we can take this as the author's independent product, which he wrote as a chapter for students: "The state as the general organization of the society." We can judge for ourselves whether this is connected with scientific socialist theory.

Let us return to Rainko's views. Discussing the issue of the decline of the state, he recalls actual controversies tied to the use of the concept of the dictatorship of the proletariat. Rainko writes, "The perceptible resistance to the expression 'dictatorship of the proletariat' vis-a-vis the current socialist state are not necessarily the expression of a kind of opportunism. It arises out of actual difficulties in understanding something which is subject to change and cannot be understood equivocally. The situation is different with analogous resistance in West European communist parties. This resistance and its causes are at least not unambiguous." (p 46) This type of explanation is ambivalent. First of all, the essence of the controversy does not concern expression but rather the entire theory of the dictatorship of the proletariat. Semantic doubts prevent rejection of the theory and practice of the dictatorship of the proletariat. Regardless of the reasons given by the various theoreticians, theory is an expression of ideological opportunism. Class struggle decides the issue. Secondly, the argument that the abandonment of the concept of the dictatorship of the proletariat in describing the current socialist state, for instance in Poland, has been caused by the fact that the subject itself undergoes change is totally pointless. The same can be said for the entire state of social reality and acknowledges that no theoretical categories have the right to be a part of social sciences. This resistance does not concern only the expression "dictatorship of the proletariat" but also expressions like "class struggle," "class conflict," and "rule of the working class." Conceptual offshoots of bourgeois theory which only confuse the issues of the socialist state are introduced in place of these expressions.

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POLITICS

POLAND

FEAR OF PUNISHMENT WILL NOT STOP CRIME

Warsaw POLITYKA in Polish 17 Aug 85 p 2

[Text] "To the Minister of Justice..." volumes already have been written on fear and surprise as mechanisms. A recent press communique shows that 6,500 persons have been accused of speculation in the first half of this year. This number has increased by 50 percent since last year and it is only the latest illustration that social honesty cannot be supported by fear. This has been known for some time.

You, sir, will not put a guardian angle behind every citizen. One has to count on society's respect for social order rather than on the breaking of it. One must have his/her own choice to follow social good.

Moreover, there is nothing in common with the social feeling of justice and good acts through fear. The principle of justice should be tied to the actual measure of the offense. And so as to recognize these measures honestly, the court has to be independent of the dictate of riotous emotions, and especially of feelings of revenge. This is why the masses never will be able to decide on the level of guilt or punishment. Punishment "for example" is the denial of justice and not its realization....

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POLITICS

YUGOSLAVIA

#### REASONS FOR LOW UNEMPLOYMENT IN SLOVENIA EXAMINED

Zagreb VJESNIK in Serbo-Croatian 12 Oct 85 p 4

[Interview with Andrija Vlahovic, director of the Assembly of the Association of Self-Managed Communities of Interest for Employment of Slovenia, by Marika Toth; date and place not specified]

[Text] "In our new situation, when so many thousands of people are unemployed, the old way no longer works, and we need to find new methods of action. We in Slovenia are trying to do this, and I can tell you that the officials of our Self-Managed Communities of Interest (SMCI) for employment spends as much time with the unemployed as they spend with work organizations asking their professionals whether or not there is any possibility for new jobs, or planning how to productively employ the technological surplus which appears when any operation modernizes."

This was all that the director of the Assembly of the Association of Self-Managed Communities of Interest for Employment of Slovenia, Andrija Vlahovic, said at a not so recent workshop on productive employment, held in Karlovac. Nevertheless, his words--chiefly because they hint at an active relationship with these problems and their prevention, and not passive waiting for things to change--served as the impetus for new questions when time allowed. There is not much time left even now, but there is one fresh statistic which is certainly exciting: of approximately 2 million inhabitants, and 850,000 employed, Slovenia only has approximately 14,300 unemployed. This statistic is significant in a world-wide context (not, of course, if it is compared with the countries of Eastern Europe). So the question can no longer be avoided: why has Slovenia succeeded? The appropriate spokesman to provide the answer is none other than Andrija Vlahovic.

"The answer is not simple, but perhaps what is most characteristic for us is that in the employment field in Slovenia, we do not just work with the unemployed--they are, you will see, just a small part of our activity--but with all employed and, particularly importantly, with those just entering the workplace. In other words, we are attempting to create conditions where as few people as possible have the opportunity to become unemployed.

### Three Conditions

[Question] How?

[Answer] First of all, we have a very developed professional orientation which focuses on the workplace and not on education. We follow every young person for six years--from the seventh grade of elementary school until the end of high school--so that we can do a good job of directing him toward his abilities. It helps that there is not much prejudice in Slovenia toward certain kinds of work, a desk job is not valued higher than a blue collar job. Maybe this is a result of the fact that the level of technological development of the Slovenian economy is lower (that's right: lower) than it is in the rest of Yugoslavia (in Slovenia less was built brand new and according to the latest technology, more often the old was modernized). The Slovenian economy is more labor-intensive, and the time of its development was not the time to necessarily push for highly-educated manpower. Thus today in Slovenia the children of highly-educated parents are not reluctant to train to be machinists. And even their parents point them in this direction, having reasonably realistic views toward work and employment.

Perhaps this professional orientation was made easier by the fact that Slovenia turned to polycentric development in time--not just Ljubljana has developed, but so have many other smaller towns; and villages have become urbanized. Thus the possibilities for employment are varied, and pressure on the city, with all the consequences (in addition to unemployment) born by the individual and society--was less. In addition, the status of all who work has been equalized: not just those employed in the social sector, but private workers as well as individual farmers. All have health insurance and guaranteed pensions, they have the opportunity for self-management, and can even, in some cases, be members of trade unions. All of this makes the diversified field of potential employment as attractive as it makes the possibilities for directing it broad.

The second part of the field which relates to young people is the scholarship system. This applies to all young people who go to school, and the scholarships can be either from specific work organizations or from associated resources--a fund into which .5 percent of the gross basic income of all those employed in the republic is poured. The majority are specific work organization scholarships, and those from associated resources apply only in those instances when there are not enough funds from work organizations. But both types are in the service of employment: they are given out first of all for those professions where there exists the possibility for employment. It is unique to Slovenia that there are more scholarships offered, especially in professions such as mining or forestry, than are given out. The scholarships are negotiated and given out in the communities, on the basis of social agreements whose signatories are all the communities and specific republic agencies.

Third, four years ago when the high school system was reorganized, one of the more significant reforms was that a student could leave the educational



system to work after just 1, 2 or 3 years of study. After their schooling --regardless of whether they have spent 1 or 4 years--all pupils must have a 6 month training stint, for which they must obtain a certificate. This is organized either in the work organization where the student will later work, or if the appropriate conditions are not present, or a training program does not exist, in another organization, according to an agreement.

#### Every Organization of Associated Labor (OUR) "on Radar"

[Question] This means that education, employment activities and communities work closely together in the field of employment.

[Answer] Correct, and without this cooperation we could not accomplish anything. In every community we have coordination councils for scholarships, and executive councils for employment. People from employment and education cooperate as closely as possible with the economic chambers, and thus step by step fences are torn down.

[Question] How do you succeed in breaking through the barriers of work organizations, which is a big problem in other areas, frequently resulting in employment resolutions being still-born?

[Answer] We fight against this in many ways. First of all, we never ask anyone to employ a new worker just for the sake of employing him, rather we seek full productive employment. Professionals have a variety of definitions for this, but it is basic that a new worker on a new job work not only for himself, but so that other workers can find work. Second, we strongly insist that work organizations have yearly plans for scholarships, training, and employment. Their implementation is controlled mid-year by the community. This allows us to have every work organization "on radar" so that we can establish precisely how things are going. Then, if something is not working as it should, we go to the work organization, talk, confirm and look for ways to implement what has been agreed upon. In addition, advice given by SMCI for employment professionals is respected, and if we win over 10 work organizations in a community, it is already easier with the rest. The result of all this is that, in fact, the majority of the younger generation is employed directly, without intervention by a SMCI for employment; and that only a third of unemployment is made up of those looking for employment for the first time (the next third by difficult to employ people, for example, the handicapped, and the last third by "fluctuators"--those who are always looking for something better). It is no small thing that the average waiting time for a job is only 3 to 4 months. In addition, there were just 323 people with higher education waiting for work in July.

[Question] The professional services of the Self-Managed Communities of Interest for employment, therefore, have grown into classical employment exchanges.

[Answer] You could say that just on the basis of their two "lesser" functions. The easiest part of their work is administrative-clerical--preparing materials for assemblies and other agencies. But the second part,

and much more important--operational face to face--is already well developed. It is not just a matter of working with the unemployed, but also of developing the closest cooperation with work organizations. What's more, our professional services are in fact joint services of associated labor not separate departments. And we agree amongst ourselves who will do what work. Now we are beginning to develop a third and highest function of the service--developmental-planning, through which we will be able to research, predict and intervene with specific resolutions throughout the workplace. But for this area of employment, we must work closely with others within the republic, in Yugoslavia and even in the world.

[Question] You mentioned the total workplace. With this in mind, you insist on one, still not totally accepted, concept.

[Answer] Yes, I have suggested considering work in all its forms and desired results. We cannot permit ourselves to be aware of just formal work, and even more narrowly, just work in the social sector, but we have to encompass the private sector, as well as informal work which includes charitable work, compensation for graduation (you for me and me for you), and moonlighting. These are, in a way, inter-connected chambers, we must know what happens or what we can expect from any workplace. What will occur, for example, in the formal workplace if we get rid of moonlighting or supplemental work, or the other way around. We have to know--still one more example--what it means when 45 percent of those employed in Slovenia in 1984 were women, what activities have to be developed because of this and so forth.

Why the Slovenes?

[Question] In conclusion, can you say why Slovenia is so successful yet the rest of Yugoslavia is unsuccessfully fighting unemployment?

[Answer] Let what I am about to say not be misunderstood as gloating about Slovenia, but as a wish to help others. Above all, I have the feeling that my colleagues in other republics in some ways are over-whelmed by the sheer number of unemployed, so they decide on the fastest steps to lower the numbers. This is why employment is the more essential part of their work--to do everything possible to lessen the pressure on the cities and workplaces in the social sector; and where there is already employment, to coordinate it with developmental trends.

Second, considering all those differences in Slovenia which we have already mentioned, we should of course stress the general self-management climate in Slovenia which is very good. On the one hand, this enables every worker to feel that the employment of others is his problem as well, and that he can and must resolve it. On the other hand, it enables the socialization of functions which were previously strictly segregated, which makes for better cooperation amongst themselves as well as with associated labor. This is the new quality which is giving us new results. Therefore there is nothing specific which is responsible for our success. We are only implementing what we have jointly agreed upon, but we really insist on that implementation.

[Box, p 4]

#### We are not Closed Off

"We in Slovenia often have the feeling that we are being reproached as being closed off to workers from other republics and provinces," states Vlahovic. "It is my opinion, however, that this is incorrect and that every worker who wants to work, and for whom there is an appropriate job, would be happily accepted. True, there have only been 8,000 workers a year employed in Slovenia from other republics and provinces during the last three years, and in earlier years the numbers exceeded 15,000. The problem does not lie in our being closed off, but in something else. In Slovenia both lower- and highly-educated workers are needed. However, we want the workers from other republics to have an acceptable standard of living, so we insist on bachelors' dormitories among other things, which for them, to a degree, lessens the desirability of such employment, both for the work organization and for the worker who comes to Slovenia; also because this must be paid for leaving less for him to send to his family. This is why we are investing more in operations in underdeveloped republics and provinces, and there we have succeeded in employing more than 8,000 workers. This inter-republic employment can be seen as neglectful, but it seems to us more humane than a mass exodus to Slovenia.

Highly-educated workers present different problems. They would have to know Slovene, because in their work communication is essential. We do not consider this demand too great, but do consider it justified.

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SCIENCE AND TECHNOLOGY

CZECHOSLOVAKIA

QUESTION OF R&D FLEXIBILITY IN CEMA CONTEXT EVALUATED

Prague HOSPODARSKE NOVINY in Czech No 42, 1985 pp 8-9

[Article by Ing. Mirko Misik from the Research, Technology and Economy Information Center, Prague: "When Our Own Efforts Are Not Sufficient"]

[Text] The article "Science and Technology Progress in CEMA Countries", written by Ing. Petr Kynstetr, CSc., published in HOSPODARSKE NOVINY No 22, dealt with various forms of accelerating science and technology progress introduced in socialist countries. One of such forms treated by the author is the transfer of research and development results into practical use under the supervision of specialized organizations. With regard to the importance of these organizations and to the success they are achieving in countries where they have been introduced, we consider it useful to inform our readers thoroughly about their activity and their standing in the system of management mechanism of the national economy.

The mission of introductory, intermediate or engineering realization organizations is to help in general to introduce the results of research analyses, inventions, improvement suggestions and progressive experiences into practical use.

They are being experimentally verified in some CEMA countries. Certain experiences, based on activities of such organizations, were gathered namely in the BPR, HPR and USSR. The prerequisites of setting up a larger number of such organizations are presently being verified in the USSR and the exploitation of domestic as well as foreign experiences is taken into account at their establishment.

The development analysis of various forms of integration of science into production shows that the evolution of any of them is connected with the solution of certain problems on the limit between science and production or practice respectively. The innovation process may be divided into two global stages: the first stage is preparing the invention for production use resulting in the potential effect of the given innovation; the second stage is the actual use of the results of R&D, invention or improvement suggestion for the purpose of enhancing the scientific, technical and economic level of production and to introduce new production. The outcome of this stage is the accomplished real effect of scientific and technological progress.



## The Economic Barrier

Practice has taught us that on the borderline of these two stages there often appear substantial organizational and particularly economic difficulties. The costs connected with the actual realization of R&D results mostly exceed greatly the costs spent on their acquisition. Thus, at the end of R&D arises an economic barrier that obstructs the practical use of its results. Beside high economic demands, the realization of R&D is as a rule accompanied by a whole line of rather important organizational problems, as, for instance, how to assure complete fulfillment of other planned tasks during a period when concentrated attention of management economists, technicians and maintenance people together with a higher number of service personnel is required for the running-in of the new production. Moreover, many medium and small enterprises do not dispose of adequately qualified and trained personnel to introduce the innovation by their own means, without risk and on acceptable schedule, as that usually requires to put into operation new and more sophisticated engineering. In order to bring maximum economic effect, an innovation cannot be introduced in one enterprise only, but everywhere else where it is desirable from the point of view of the national economy. Such horizontal expansion brings about another problem, the solution of which is outside of the sphere of interest and possibilities of the executing organization.

The importance of the above-mentioned problems requires that they be solved by various organizational forms that help to transfer faster R&D results into practice. The most current method of achieving such results is, above all, to do it by the resources of the relevant enterprise, organization or other economic production unit. At the same time, it is necessary to keep in mind the concrete circumstances of each guild, enterprise and plant and to ensure an entire line of relevant measures. The organization has to prepare by its own means the required documentation, ensure the authorization procedure, manufacture on its own premises different non-standardized accessory equipment, secure manufacturing of prototypes, test them, etc. To introduce technical innovations in this manner is feasible only in large organizations having at their disposal all necessary resources, adequate projection potential, construction and development workshops as well as certain reserves of production capacity to cover temporary production losses. As a rule, some of these prerequisites are not available in medium and small enterprises and they are therefore unable to handle the realization of such innovations on their own.

In some socialist countries, the above-cited facts brought about new specific forms of scientific and technological activity with the purpose of rendering different engineering and consultative services enabling organizational, technical and economic aid to those organizations that introduce new technology. The organizational substance of such services are then special, so-called introductory, realization or intermediary enterprises and organizations which are helping to transfer--for payments and on the basis of economic contracts--the results of research and development, of inventions and improvement suggestions into practical use.

In capitalist countries where, contrary to socialist economies, a substantial part of industrial potential is based on medium and small enterprises unable to insure their technological development by their own means, this function is taken over by various technological, intermediary and consulting firms of great variety of specialization. Some of those firms have been in existence for already several decades, many others are established on temporary basis only and having fulfilled a specific contract, they are later closed.

In socialist countries, this is an entirely new type of organization which, however, is by no means a substitute for research and industrial associations, combined enterprises, research institutes, construction and design offices or other organizations. Introductory organizations are created mainly for the purpose of generally supporting the introduction of results of already accomplished R&D work into production, to accelerate the materialization of such results in the largest possible measure and to help overcome the barriers between research and development on one hand and the implementation of new technology on the other hand. The activity of such organizations is based on competitive selection of research and development results, on inventions and improvement suggestions, according to anticipated economic contribution and on general support to transfer the most effective measures into practice.

#### **Bulgarian Experiences**

Bulgaria and Hungary may be considered pioneers in introducing new methods of accelerating scientific and technological progress through specialized organizations under the conditions of a planned economy.

The organizational integration of science with production was started in the BPR at the beginning of the 1970's. Several scientific production organizations were created in the most important branches of the national economy with the aim to verify what influence will have a closer linkage of science and production on accelerating the realization of R&D results. At the end of the 1970's, 40 such organizations were already active in 12 branches of Bulgarian economy. The most widespread form became associations for scientific production, where science was represented by research institutes, planning and construction workshops and production by industrial enterprises. To this type of organizations belong, for instance, The Technology of Metals, Balkanstroj and others. In these organizations, a close collaboration of science with production enabled to shorten by approximately 30 percent on the average the delays of introducing new items into production.

Later were introduced new organizational forms of comprehensive control process from science...to application, namely the so-called pilot engineering organizations. This status was granted to selected institutes, scientific production organizations, foundations for development and introduction of new products, testing stations and experimental bases, laboratories and others. A pilot engineering organization may be an independent economic unit or its subdivision. As such may also be recognized a functional department of ministries and large associations. They act either as independent units of an organizational structure or as its sections.

To a certain extent, an exceptional standing occupies the center for accelerated realization (modernization) "Progress," whose principal task is to organize and introduce state of the art domestic and foreign R&D results into production. It is primarily centered on launching economically important S&T findings applicable in several branches, where the realization is connected with certain risks and temporary deterioration of economic results. "Progress" further helps to exploit joint R&D findings obtained from abroad (patents, licenses, know-hows and other similar documentation), it negotiates orders from production and scientific organizations for various R&D works, for manufacture of prototypes, samples, etc. Introducing innovations, Progress takes certain risks arising from possible failure. While fulfilling its duties, it chooses however individual prospective actions according to economic criteria and thus determines itself in advance the effectiveness of its work.

### The Extraordinary Standing of "Progress"

"Progress" is an economic organization. It bases the relations with its partners on bilateral and multi-lateral economic contracts. It accumulates all its assets in its development fund, one part of which is made up in national currency, the other in convertible currencies. The fund formation and its expenses are regulated by a yearly financial plan approved by the chairman of the National Committee for Science and Technology Advancement. The management of "Progress" is entitled to make changes in this plan within previously approved limits. The accelerated development fund of the "Progress center" (in national currency) is made up from contributions obtained from the technology development fund of the National Committee for Science and Technology Advancement, from inventions and rationalization fund of the Institute of Rationalization and Inventions and from profits of enterprises which had introduced innovations with the assistance of the Progress center. The amount of the latter contributions represents 30 percent of the yearly profit from the innovation during the first 3 years of its application.

The basic assets of the accelerated development fund (in convertible currencies) are shares from income obtained for patents, licenses and know-how, sold by the center; other assets are based on bonuses for foreign currency savings achieved by introduction of technology measures enabling limitation of imports from capitalist countries or exports there. The center is further authorized to exploit advantageous credits from the Bulgarian National Bank and has a priority right in the supply of materials and raw materials.

The "Progress" center has approximately 80 employees. Organizationally, it is divided into several small permanent divisions manned by highly qualified experts from various branches of science and technology. To these divisions are added, when needed and on a contractual base, different scientific, engineering and economic organizations having direct interest in the introduction of R&D results into practice. Since 1982, joint centers of accelerated realization may be created together with other engineering organizations in order to exploit the results of research and development with divided risk and responsibility for the results of joint work.



The "Progress" center is also authorized to organize temporary goal-oriented inter-branch collectives where, for the sake of fulfilling various science, technology and economy aims, can be united efforts of mathematicians, physicists, chemists, biologists, economists and other experts from diverse organizations. These specialists, made available for temporary work assignments in the collectives of the center, have to be able to regain their functions and salaries in their own organizations after their assignment in the center is accomplished.

According to Bulgarian sources, "Progress" contributed to accelerate by 30 to 40 percent the innovations it participated in. Among the most important ones belong the establishment of the Telecard system for great distance-transfer of electrocardiograms, new technology of centrifugal casting of pipes, production of elastic magnetic disks for computers, systems of sprinkler irrigation of vegetables, etc. Progress contributed to the development of Bulgarian robots and due to its efforts the robotization program of the Bulgarian national economy has been accelerated by 2 years. During the period of its activity it introduced approximately 100 innovations, with an estimated profit of 4 million Leva to its fund, while the economic effect from these innovations exceeded 70 million Leva.

It is estimated that the results could be even better, if certain continuing deficiencies could be eliminated. Conforming with approved principles of activity, the center is guided by somewhat more liberal regulations on financing, credits, rewards for services rendered, etc. than those valid for the other S&T organizations. All the center's requirements for delivery of machines, equipment and material should be covered preferentially from the funds of the National Planning Commission and the National Management of Material Reserves. Preference should be given as well by the enterprises of foreign trade to all orders of the "Progress" center for imports. It should be stated, however, that such engagements, as well as those resulting from contracts with partners, are quite often met with substantial time delays. All this complicates the work of the center and makes it rather difficult. Therefore, the measures taken at present should ensure more promptly the needs of the center and strengthen its own technical and development bases. Special attention is paid to the creation of mixed enterprises for accelerated realization of won R&D results where, next to the Progress center, other engineering organizations would be represented.

#### Incentives for Hungarian Inventors

Another CEMA country which has gained experiences from the activities of organizations specialized in transferring R&D results into practical use is the Hungarian People's Republic. For quite a few years already, several organizations of this kind have been active there. Among them should be mentioned in the first place the General Financial Institute for Innovations - formerly the Innovation Fund - further the Industrial Innovation Fund (enterprise "Technova"), the Financial Association for Development of Technology, the organization for introduction of inventions "Nove" and others.



The General Financial Institute for Innovations was founded in 1980 as an independent agency of the Hungarian National Bank. Its fundamental mission is to financially support the innovative activity of economic organizations, especially where certain risks are involved. Beside this principal orientation, the fund assists as well individual inventors and innovators in their endeavour to put the results of their efforts into effect. Mainly supported are measures resulting in saving raw materials, energy and other materials or bringing a high profit to the national economy.

The sources of financial means of this institution are the participation in profits of the Hungarian National Bank and a part of assets of the National Commission for Development of Technology. Their overall volume for 5 years is 600 million forints and represents grossly 1 percent of the amount spent on the national budget for development of science and technology. Upon presentation of a request for financial support, the institute verifies it thoroughly--usually with assistance of external experts--before it decides to grant it from its own resources. The main criterion for a decision of its participation in a given action is the ratio between the anticipated costs and anticipated economic result. The institute pays from its own resources the following expenses: execution costs of an expertise and economic evaluation, part of expenses connected with production and verification of prototypes, investments in setting-up and running of semiproductions, in zero series production, etc.

It does not participate solely in the financing of the above-mentioned activities, but in their management and coordination as well. Financial means granted to producers are not considered a loan, but a share; according to its amount, the General Financial Institute will then participate in the profit, possibly also in a loss, in compliance with the conditions of a previously made contract.

Between the Institute and its partners, contracts of several types are concluded; they depend on the stage of execution of the R&D work and on the partners participating in the contract. The contract always stipulates the rights and duties of the parties; one of them is the right of the institution to determine the spheres of production, connected with the interests of national economy. The contracts always have to include a cost estimate according to stages, further a progress chart of the work and a review of sanctions for non-execution.

The institute spends its resources in compliance with the principle of joint risks and benefits. If its management decides--on the base of the expertise results--to stop the financing, the producer is not obliged to return the money granted previously by the institute. In case of successful realization of the innovation, the producer pays the previously agreed upon participation profit to the organization until the amount, stipulated by the contract, is reached. It is requested that financial losses from unsuccessful ventures be compensated by gains from effective ones.

## In the Sign of Innovations

The establishment of the General Financial Institute for Innovations aroused an extraordinary interest among Hungarian enterprises, research institutes and other organizations, as well as among investors and innovators. In the 3 years of its existence, it received more than 600 applications and proposals. One third of them was outright refused, as a rule due to unsatisfactory effectiveness. In 1980, the financing of 42 projects was initiated, in 1981 there were already 57, in 1982 69 projects. Most of them are geared to the development of new technology procedures, to new products and to industrial equipment, some of them to consumer goods.

In the first 3 years of its activity, the institute granted 240 million forints; at the end of the third year, about 40 percent of capital spent during the first 2 years were reimbursed. Approximately one fourth of operations initiated had to be scrapped immediately after the expertise was concluded. However, the thus incurred losses were not important.

In spite of undeniable successes, the institute has to overcome many problems according to the opinion of Hungarian economists. The lack of experts and agencies, willing and able to secure and coordinate all activities connected with introduction of R&D results into practice, is believed to be the main problem. As unsufficiently resolved is deemed to be the material and moral stimulation of the participants, which causes to the small team of the institute (only 12 employees at the end of 1983) considerable difficulties. Despite these problems, the agency is living up to its tasks and has proven its justification and viability.

The results of the institute's activity inspired the HPR Ministry of Industry to start in 1983 its own similar agency, the Industrial Innovation Fund, under the name of "Technova." Basically, the function of this agency is identical with the functioning of the General Financial Institute for Innovations; it serves organizations under the authority of the Ministry of Industry. There are, nevertheless, certain differences between the orientation of "Technova" and of the Institute. "Technova"'s basic form of financing is an innovation credit, granted as a rule for 6 years, under the condition of a joint participation in profits and risks and mutual advantages. Technova grants financial assistance in the form of profits and risks participation only if the earnings from the participation are expected to be higher than the credit interests.

It is expected that "Technova" ensures a broader net capital formation of its financial assets. The maximum profit however is not decisive for its activity. In conformity with the technology policy of the Ministry of Industry, it keeps the lower rentability level of its activity at 3 to 6 percent. All expenses--wages, salaries to externists, production costs, payments to the technology development funds and others are covered by "Technova" from its own income, gained from interests of innovation credits, from participation in profits at non-refundable contributions and for rendering or negotiating various services.

Another Hungarian organization for intensification of science and technology progress is the Financial Association for Technology Development, founded on the initiative of the National Commission for Progress of Technology and the HPR Investment Bank, together with "Technova." The Investment Bank pledged to grant to the Association, in the course of 1983 to 1985, 300 million forints for the creation of its financial fund.

The fundamental mission of the Association is to assist financially enterprises and organizations in ensuring introduction of new technology into production envisaged by the plan for development of science and technology. The association functions under similar principles and regulations as "Technova," i.e., it grants primarily innovation credits; however, it can also advance investment credits contributing to the manufacturing of new products developed in the framework of the state plan for development of science and technology. The credits are granted to petitioners according to the results of competitive proceedings organized by the association. From the 60 so far presented applications, 40 were accepted. To finance them, the association will make available 150 million forints from its funds. In the future, the association intends to grant credits with the provision it will participate in the profits of the effected innovation. It is considered that it will finance, together with the National Commission for Technology Development, some risky ventures of the state science and technology programs. The initial phase of the process science... to utilization should be financed by the National Commission and the follow-up phases by the association.

#### Experiences of the Soviet Union

In recent years, organizations specialized in transferring scientific and technology experiences into practice were created. Among them should be cited: the Moscow experimental engineering production enterprise "Energotechprom," the Azerbaijan production center for installation of science and technology findings and progress experiences connected with the State Planning Committee of the Azerbaijan Soviet Socialist Republic, the organizations "Effekt" in Tallin, "Orient" in Riga and others. Their mission is to assist in general inventors, innovators and primarily medium and small enterprises lacking the prerequisites to carry out innovations on their own. All the cited organizations are working on the cost accounting principle.

In spite of achieved successes, their activity encounters many problems. Some are unable to resolve questions of organizational character, others cannot clarify principles of dividing up the created assets between the pilot organization and its partners, etc.

In most of the Soviet pilot organizations, there are being established subdivisions necessary for comprehensive transfer of S&T results into practice. With regard to foreign and domestic experiences, it is considered useful to generalize the principles of founding branch pilot and intermediary organizations and to build up their network in the entire country. The principal task of such organizations should be a fast expansion of innovations in the whole branch and assistance to enterprises lacking the prerequisites to carry out innovations with their own resources.

At the same time, it is considered useful to establish in the USSR a specialized inter-branch pilot organization which would finance the introduction of such innovations and inventions of inter-branch character that are not part of departmental plans of S&T development and that could, with acceptable risk of failure, be of substantial effect to the national economy. The capital fund of such organization should be created from the assets of the unified fund for S&T development and of a part of profits of organizations implementing the new technology. In principle, the activity of this organization should be directed by the same rules that apply for the Bulgarian "Progress" or the Hungarian Institute for Innovations.

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The activity of some years of the pilot organizations in the CEMA countries enables us to make certain generalizations about such forms of enterprise:

- \* By their activity, the pilot organizations weaken considerably the existing economic obstacles to implementation of innovations;
- \* New economic incentives and organizational conditions for the solution of inter-branch S&T problems are arising;
- \* An area is being created for more operational and more flexible management of the realization of prospective innovations;

On the other hand, the influence of pilot organizations should not be over-rated and it should not be expected that they will solve entirely problems originating from inadequate economic interest of organizations and enterprises in introducing R&D results into practice. It is however important and fundamental that there is being created a more flexible organizational and economic mechanism for creation and exploitation of financial, material, cadre and other resources for the benefit of intensifying science and technology progress.

From the present short-term practical experience of pilot organizations it is evident that their activity proceeds basically along two main lines.

Firstly, they gather an extensive collection of information on the following: new R&D knowledge ready to be put into effect; experts, interested to contribute, possibly even in their free time, to a greater effectiveness of their work; organizations and enterprises able to offer to the pilot organizations their services; enterprises interested in and requiring to realize innovation operations.

The second fundamental orientation of pilot organizations consists in their own implementation of innovation plans. For this purpose, these organizations set up the already cited internal subdivisions composed of their own employees and of external or temporarily employed experts. The task of such collectives consists in assisting the production organizations to implement the innovation in concordance with the concluded contracts.



In conclusion, it may be stated that the activity of pilot organizations contributes to the increase of work efficiency of the entire R&D potential, to the acceleration of R&D progress and to the growth of effectiveness of the entire national economy in their respective countries.

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SCIENCE AND TECHNOLOGY

POLAND

RESEARCH CONTRIBUTIONS IN ASTRONOMY, SATELLITE REMOTE SENSING

Warsaw ASTRONAUTYKA in Polish No 4, Apr 85 p 2

[Article by W.G.]

[Text] Low-Frequency Wave Plasma Analyzer

The successful launches in December 1984 of two Soviet space probes VEGA 1 and 2 towards Venus and Halley's Comet (incidentally, with Polish-made equipment for study of low-frequency plasma vibrations) have certainly focused attention of those in our society interested in space research. In 1980, the Space Research Center of Warsaw accepted a request by the Academy of Sciences of the USSR to develop an instrument for studying the gas conversion of matter (which is the main constituent of Halley's Comet) as it is heated by the sun when passing near the perihelion. It is assumed that the material of comets belongs to the most ancient forms of matter from which the solar system was made.

The equipment developed in Poland for the Soviet space probes is called APV-N, which stands for plasma analyzer of low-frequency waves. It consists of sensors of two types: electric sensors measuring the field fluctuation and a plasma sensor measuring the density fluctuations of plasma. The scientific aspects of the experiment and the research program have been developed by Dr. Pawel Oberc from the Space Research Center, while the actual construction of the equipment was carried out under the direction of Zygmunt Krawczyk, DSc (Eng), from the Aviation Institute in Warsaw, jointly with Zbigniew Zbyszewski, MS (who created the concept of a large number of instruments), from the Satellite Electronics Laboratory of that institute.

Polish equipment units operate on 5 W power sources and have undergone complicated tests for about three months.

Another assignment undertaken by Polish scientists and specifically the team working under the direction of Professor G. Sitarski at the Space Research Center, with astronomers from Krakow, Poznan, Torun and Warsaw, is precision measurement and calculation of the orbit of Halley's Comet.

## Polish Measurement Instruments Used in India

Under the Interkosmos program, Poland is taking part in constructing and providing equipment for an Indian station of measurements and observation of artificial earth satellites at Kawalur near Bangalore. This is one of 30 world stations situated in the latitudinal direction near the equator and in the meridional direction from Spitsbergen to Antarctica. The laser ranger installed at the station is furnished with Polish time counters. Polish equipment has already been installed at more than a dozen stations around the world.

## Studies of Interstellar Clouds

Taking advantage of the recent peak in solar activity, studies of solar wind have been conducted in Poland (in the framework of the Interkosmos program) analyzing interstellar matter. Interstellar clouds consisting of hydrogen and helium penetrating inside the solar system meet with a flux of particles ejected from the sun, the solar wind, which produces various effects that have been investigated by the Space Research Center in Warsaw for several years.

## Studies of Magnetic Stars

Astronomers at Warsaw University are investigating magnetic stars. These stars generate a very strong magnetic field and are much colder than the sun. They are also characterized by periodic fluctuations in brightness. One of these stars is located in Draco--about 200 light years from the earth. Another makes up part of Cassiopeia, about 1000 light years from the earth.

## Polish Telestar

Telegwiazda [Telestar] is the name of a piece of equipment designed by the Institute of Electronic Principles and the Institute for the Construction of Fine and Optical Instruments at Warsaw Polytechnic under the direction of Grzegorz Czajkowski, MS. The program coordinator is Slawomir Makal from the Space Research Center. The order for this equipment was placed six years ago under a Soviet-French experimental program with registration of gamma radiation from space for orientation of artificial satellites in flight. This radiation cannot be observed from the ground, because it does not pass through the atmosphere to the surface of the earth.

In the planned experiment the satellite will carry a telescope (mass of 1.5 tons) based on gamma rays; a device developed at Warsaw Polytechnic Institute will be the "eye" of this telescope. Gamma ray signals received by this device will be transmitted to the electronics block, where they will be analyzed by a microprocessor so as to identify the two brightest sources of this radiation (stars or galaxies) to determine their bearings and amplitude, which is sufficient for satellite orientation. This explains the name of Telestar given to the telescope eye. Thanks to its installation, the program can now be described as a French-Soviet-Polish experiment.

## The Use of Satellite and Aerial Observations in Mining

Infrared photography of large areas of the earth is known to be used in remote satellite detection for various economic, meteorologic and navigational purposes. When used at night, it is called night vision. Until now, however, it has not been applied for mining conducted underground. It has been found that thermal vision--based on converting the infrared radiation of areas that have a higher temperature than their surroundings into a different form of energy such as electricity or chemical energy (thermographic image)--can also be used to detect thermal effects occurring in mines. The rocks that form the roof of a mine threatening to collapse conduct heat differently than surrounding rocks which exhibit no fissures or exposures observed in beds remaining above excavated seams of coal or other minerals. In horizontal workings, this causes temperature differences on the earth's surface which can be observed on thermographic maps. It is also possible to detect the areas hazardous for coal self-ignition, as indicated by local temperature rises in the coal seam.

Tests conducted in Pstrowski mine detected such potential sources of underground fires, where coal temperature rose above 40°C.

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POLAND

## RESEARCH ON FIRE-RESISTANT PLASTIC MOLDING COMPOUNDS

Gliwice CHEMIK in Polish No 8, Aug 85 pp 199-203

[Article by Wieslaw Nowaczek and Wacław Krolkowski, Department of Synthetic Materials and Protective Coatings, Institute of Chemical Technology, Szczecin Polytechnic: "Reducing the Combustibility of Compounds of Unsaturated Polyester Resins"]

[Excerpts] Much attention has been given to reducing the combustibility of plastic materials both in countries with a high level of plastic material consumption and in those where replacing traditional materials with polymers compounds has begun recently.

The studies are concerned with such aspects as toxicity of the ingredients reducing the combustibility and the polymer decay products, improved combustibility tests, effects that arise in the course of polymer burning and various applications. In Poland, combustibility of plastics is studied by several academic and industrial institutes, but most of these studies are concerned with applications of foreign-made preparations, because there are no domestic fire-resistant additives. The situation with domestic halogen polyester resins is also unfavorable. There are two types of this resin used in Poland: Polimal 162 with HET acid (hexachloroendomethylene tetrahydrophthalate) or Polimal 160. They are produced by catalytic copolymerization of maleic and phthalic anhydride with epichlorohydrin.

The former can be used to manufacture lower-combustibility polyester molding compounds, but their low resistivity to leakage currents prevents their use in electric insulators, greatly limiting their possible applications. The other resin, Polimal 160, can be used to produce dough-molding compounds [DMC], but is unusable for sheet molding compounds [SMC]. This is because the polyester chain of this resin contains no free carboxyl groups and at both ends is terminated by hydroxyl groups. As a result, it is incapable of reaction with oxides or hydroxides of alkali earth metals, which is the basic process in the manufacture of sheet molding compounds.

The development of Polish polyester molding compounds with a reduced combustibility is predicated on the projected introduction of an industrial aluminum hydroxide plant. In 1978-80, the Department of Synthetic Materials and Protective Coatings of the Institute of Chemical Technology at Szczecin Polytechnic developed noncombustible polyester molding plastic compounds of the

DMC type using domestically produced aluminum hydroxide subjected to additional laboratory processes of drying and grinding to obtain the required grain size. The materials have been tested successfully at the Electrical Engineering Institute in Warsaw and, in a few years, could become an effective substitute for plastic compounds currently produced with imported fire-resistant additives.

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SOCIOLOGY

CZECHOSLOVAKIA

WESTERN WAYS COMPARED WITH CSSR SOCIALISM

Prague TRIBUNA in Czech 20 Nov 85 p 2

[Article by Petr Stejskal: "Crutches of Illusion"]

[Text] During a panel discussion we held with future lawyers and economists, one of the participants summed up his thoughts--apparently refreshed by a recent visit to the FRG--as follows: "Be it as it may, I believe that until such time as our store windows are overflowing with goods, we cannot speak of socialism in this country." These words were supposed to be some sort of discussion contribution when we were talking about future programs contemplated by Soviet communists, and their significance for the advance of socialism here.

Can we consider the well-supplied store windows in the West the sole criterion of a perfect way to satisfy people's needs in the area of consumer goods? We have indeed experienced such a situation here in the past. During the time of the First Republic our stores were also full of merchandise, yet we must ask what good was the well-stocked White Swan department store to the unemployed?

Adequate supply of quality goods to satisfy reasonable demands of the working people, that is certainly our goal. Let us recognize, however, that this is not the moving force behind retail trade so admired in the West. There the main impetus is to sell, period. What is produced must be sold and, bearing this in mind, production tries very hard. It is no longer sufficient for the sales people to fawn over the customers. Even retail trade is affected by science and technology. Precise analyses of demand and the market, profiles of potential customers, assist in the elaboration of scientific sales methods. These have been joined by refined advertising practices brought to the point of perfection. That is the substance and internal mechanism of the stores which offer their attractive displays in towns and villages in the West.

We have no intention of stamping such practices on our retail trade establishment.

Another small "detail," which somewhat diminishes the effect of the overflowing store windows west of the Rozvadov border station, emerges only after some time spent, let us say, in the FRG. Yes, the stores are full, for instance, of various types of crackers and snacks, yet when visiting someone you are offered one or two of each, rather than a full box, as is the custom here. This happens even with friends in the West, even though you get more if you ask

for it. Thrift among common people in the West is quite distinguishable from our Slavonic understanding of hospitality, and is typical of most consumers there. Such frugality is not a feature prompted by some sort of higher culture, but rather by necessity.

Economic conditions, the amount of income and the cost of services, such as health care or education, are the reason why the average Viennese or Parisian simply passes by such well-stocked establishments. They have no time nor money to spare. For most of the unemployed millions who are part of a society which flaunts abundance, these establishments might just as well not exist, except for occasional low-price sales. Thus, the army of unemployed existing on various subsidies, or even vegetating without any means whatsoever, represents a characteristic, and in a capitalist society quite natural and lawful, regulator of demand and of those who actually enter such stores. These are considerations we do not know here, nor do we want to know them.

Nevertheless, we must purposefully create conditions for better supply of the population and, in the final analysis, we must do so better than capitalism. This means providing a broad variety of commodities with a corresponding range of the price spectrum. This is a long-term task which is difficult in a socialist society since, with few exceptions, there are no conditions nor interest in prestige-oriented luxury consumption which in capitalist societies is used to attract the inordinately high parasitic income of their elite. In our country, price must go hand in hand with quality. The slogan "good reward for good work" must, in the long run, be reflected in consumption. Toward this goal, we have embarked on a path followed by only a few socialist countries so far. The prescription is not simple, yet to follow merely the road of "old and tried mechanisms," such as trading with industrially developed capitalist countries, would be an evasion of the problem, if not a step back.

Behind the tinsel of overflowing store windows in the West, there are many hidden facts not discernible at first glance. In deeper examination, however, we find that these are of varied provenance. From some we can indeed learn, others we simply reject.

Our aim is not merely to fill our shops with goods, even though complaints about certain shortages are justified, but rather to make sure that people find what they need and wish to buy with their hard-earned money. In this respect we cannot be satisfied with our performance. The problem can be resolved only through higher production and expanded exchange of goods among the socialist countries. This is precisely the ultimate goal of our and Soviet planning through the year 2000. We will not achieve this through "aping" Neckermann, Sears or other famous firms in the West, and it is sad that this type of logic has somehow bypassed some of the participants of this discussion. Otherwise, they would not be presenting their illusions of "stores in the West" as the only way of satisfying people's needs in the present developmental stage of socialism which we have achieved.

Even such a frequently-discussed problem as the helpfulness or lack of it among sales people cannot be resolved by emulating the practices in the land of "overflowing store windows." The salesperson there is forced to sell, for in



the capitalist system such employees must sell not only goods but their personalities as well. If they fail, they are simply replaced by someone else who is better qualified and more aggressive. We too desire better customer relations, but threats of unemployment are not part of our program. Thorough education and socialist principles of rewarding labor create sufficient room for distinguishing good or bad performance.

The need is, however, to apply these well-known principles more consistently in the future. Such thorough application of that which is valid and well known to all, provides the starting point for a march ahead on the road of socialist transformation.

We cannot succeed without clear awareness of socialist development as a whole, as well as the individual areas in the life of our society. We will not get far if, instead of precise thinking and concrete deeds, we succumb to the crutches of illusion.

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SOCIOLOGY

CZECHOSLOVAKIA

#### DOGMATISM CRITICIZED FOR BEING ABSTRACT

Prague TRIBUNA in Czech 27 Nov 85 pp 8-9

[Text] The essence of dogmatism is that it severs the correct ideas of classic Marxist-Leninist writings from their specific contents and the context in which they appeared and makes them into abstract formulas which are then used for new and specific events and situations. In so doing, dogmatism must elevate some aspects of the teachings of classic Marxism-Leninism and suppress others so as to create a logically formed system of formulas applied to new phenomena of social development. Instead of studying actual facts, it is devoted to perfecting the formulas of thinking under their unrelenting pressure so as to use the individual teachings becoming even more abstract, less viable, and more removed from the facts. Because its practitioners believe in their system of theses above all else, they overlook the facts and their study is replaced by self-serving "improvements" in the theory, which becomes a substitute for actual studies.

In the dogmatic method of thinking, isolated cases are elevated in place of concrete analyses of contradictions and conflicts. In such a case, research is transformed into a procedure of subordinating new facts to an abstract thesis, which is supposed to mean generalizing the facts and confirming them in relationship to the general thesis. Of course, such a procedure of demonstrating the correctness of Marxist theses by accumulated examples is unproductive and uncreative. In such cases, as V.I. Lenin showed, dogmatism is not working with reality, but changing it to an "apparent specificity."

Dogmatism will therefore fail despite every attempt to master and to influence reality, since it allows changes in theory and theoretical dealings with the facts by simple empirical description. To a certain degree, this indeed corresponds to the facts of the observed objective reality, but in essence it makes it possible, because it is based on superficial reflexes, just to compare, classify, and categorize the peculiarities and characteristics of the given phenomenon and its empirical given fact. This is the lot of dogmatism, for which dialectics has remained just a summary of examples.

Dogmatism thus gives an empirical picture of the subject studied, but the more essential sources of conflict remain outside its field of observation. When these conflicts are revealed, searching for ways to solve them results in the trial and error method being added to empiricism. And this is where it becomes infused with opportunism; for example, empiricism is not capable of explaining

medium-term and long-term interests of society as a whole, which results in research not having showed in time where and by what method the changeover to the path of intensive development should have been made. Dogmatism connected with both political and theoretical opportunism leads to theory lagging behind practice. The result is then such practical activity as is reduced to opportunistic agreements with the demands of the day.

Dogmatism willy-nilly adjusts theory to reality, but from the negative viewpoint. It seems that it can explain reality more deeply as the theoretical system is improved. The result is, of course, abstraction, formalism, verbalism, and subjectivism. Its main deficiency is the transformation of a specific truth into an abstract, absolute truth which conflicts with reality.

Dogmatism ignores some aspects of the teachings of classic Marxist-Leninist writings, but it cannot be overcome by a one-sided selection and emphasis of previously suppressed aspects of Marxism-Leninism, as revisionism does. In such a case, we are just dealing with dogmatism "turned inside-out"; it also depends on perfecting the theory, but by way of developing only a few theses without worrying about the actual facts. Because this "inside-out" dogmatism is simply indifferent to the actual problems of the revolutionary workers' movement. In both cases, the results are the same; theory ceases to be understood as a factor of actual revolutionary practice and is treated as a matter which exists in its own right and to which reality is subordinated.

The oversimplification and vulgarization of Marxist-Leninist theory by dogmatism is itself a consequence of insufficient knowledge of Marxism-Leninism. Those who vulgarize and oversimplify it explain the dialectics of both Hegel and Marx without adequately knowing them and without knowing the special science. They remove themselves from concrete analyses and attempt to transform Marxism-Leninism into some kind of skeleton key; just a collection of quotations. It is not necessary to demonstrate that such "attempts" amount to a distortion of Marxism and cause enormous damage in theory and in political practice.

Dogmatism slows down the development of scientific Marxist-Leninist thought, vulgarizes socialism as a science, and prevents the application of the critical method of dialectical materialism. This is exploited by some "innovators" in order to push their own subjective ideas on the development of socialism by making absolute values out of some new aspects of reality. The practice of the workers' movement and its development and experiences from the struggle against both dogmatism and revisionism have shown that both have subjectivism and an idealistic attitude toward reality in common. Only a thorough study of Marxism-Leninism and an intensive knowledge of practice make it possible to avoid dogmatism and revisionism in theory and in practical politics.

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SOCIOLOGY

CZECHOSLOVAKIA

# EXPERIMENT WITH ECOLOGY IN EDUCATION

Prague RUDE PRAVO in Czech 2 Oct 85 p 3

[Interview with Rudolf Koucky by Zdenek Zuntich: "Experiences Should Not Fall in Oblivion"]

[Text] Last school year represented in nine schools of the CSR the end of the 5-year experimental verification of the UNESCO project on high school education in environmental protection. Its goal was to find out how the syllabi of individual general and special subjects react to these needs, what concrete changes could be proposed, what is the relationship of young people to their environment. We speak about the past period with Eng Rudolf Koucky who was in charge of this experiment at the technical high school of forestry at Pisek.

[Question] How do you feel after the conclusion of the experiment?

[Answer] We constantly emphasize to our students three fundamental issues which have become a vital necessity for the man's existence--peace, availability of sufficient food and preservation of a healthy environment. For this reason we had welcomed that also our school could participate in this experiment, although I know that in comparison with the gymnasiums, construction or metallurgical training centers we enjoy certain advantages. Because not only our courses of study, but also the students themselves are closer to nature.

I would not like to create the impression, however, that everything proceeded smoothly. It was for example necessary to persuade the teachers that they also could incorporate these topics in their seemingly unrelated subjects. Frankly speaking, they were not much interested in it. In the course of time, however, we solved this problem. In the Czech language classes compositions gradually appeared on topics such as "Protected natural formation in my birthplace," while in the mechanics classes there was more talk of what might happen, if oil is spilled into the source of water. Ultimately there was not a single subject which was not affected by the topic dealing with the living environment.

[Question] If somebody wants to instruct students he must have a source to draw on. What source did you use?

[Answer] Much depended on the individual study. Fortunately precisely at this time our publishing house included ecological textbooks in its publishing program. The daily press also was of great assistance to us.



As to the textbooks we received a promise that no new textbooks will be published in the future without a special chapter devoted to ecology. It is necessary because the present textbooks do not pay much attention to this topic.

[Question] What was the students' reaction to these topics?

[Answer] We worked with one experimental class during the entire period of study. The students became rather easily familiar with the basic terms, but found it difficult to interrelate them. In other words, when I know something I can use it also in the broader contexts. They were interested in these problems and this was reflected also in the quality of some works dealing with the environmental protection. For example the treatises "Negative effects of ice-melting salts on the trees along the highways," "Forest buzzard," "Anthills in the Hurka Forest near the school" or "White-barked fir in the forests around Pisek" were of very good standard. As to the discussion in individual classes, the most lively was the discussion on the negative phenomena which we observe in nature around us.

[Question] We have talked so far only about the education in the classroom. What about the extracurricular education which is sometimes said to be even more effective?

[Answer] We have not forgotten it either because it is an adage that it is better for the students to "touch" things than to listen for hours to theoretical explanations. I think that every broader view no matter whether the boys gained it in the Sumava reserve, Zelivka water reservoir, on the recultivated dumpsites of North Bohemian mines, in the forests around Karlovy Vary spa or in the Ore Mountains provided them with many stimuli for the rest of their life and opened the eyes to many of them. Much work was and is still being done for the benefit of the Pisek municipal national committee. But what was most and in my opinion rightly appreciated was the 9 km long trail which the students under eng Kucera's supervision built in the forest near our school. This trail has 16 information panels, rest areas and an arbor.

[Question] The experiment has ended. What do you intend to do next?

[Answer] When we were beginning, we were asked why we were embarking on this experiment. After all, we had the subject "Protection of forests and natural environment" in which almost everything could be covered. I think that this is not possible. One subject alone cannot deal exhaustively with all the problems involved. What is important is the comprehensive approach in which we should continue even after the experiment was brought to an end. Our syllabi are more extensive than before, we have gained by no means negligible experiences and there is therefore no reason why we should not continue in this spirit also in the future. We have succeeded in this respect so far, although the school and the teachers have been doing this on their own.

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Rectors on New Higher Education Law

Warsaw RZECZPOSPOLITA in Polish 25 Sep 85 pp 1, 2

[Article by Andrzej Skrzypczak]

[Excerpts] Only a few days are left before the beginning of the school year. As is known, the schools will begin their work supported by new legal principles contained in the updated law on higher education and other laws which together embrace the whole sphere of education which were adopted on 25 July of this year.

A RZECZPOSPOLITA journalist asked prorectors responsible for teaching and student affairs at several colleges about the state of readiness to begin the upcoming academic year and what they thought of the new legal regulations.

"In spite of the fact that we only finally finished the work related to accepting students for the first year of studies in the first half of September," said Dr Jan Jakobowski, prorector of the Pedagogical College in Bydgoszcz, "the college is ready to begin work. In my opinion, the new rules will improve the way the college functions. It's a pity they were instituted so late. By clearly outlining the rights and obligations, they promote discipline among students and faculty. Management of the college will also be improved. For example, the increase in responsibility of the officers of the college is proportional to their powers. I do not think that this will harm the democratic decisionmaking process. In fact," added Professor Jakobowski, "I think the real scope of democratic management will be even greater than before. For the simple reason that, bearing personal responsibility for the success and consequences of many decisions, before making these decisions I will take great care to get the opinions of all groups at the college which are competent in the matter. As for student participation in collegial organs, basically their numerical representation remains the same. On the other hand, guaranteeing places in these organs for representatives of youth organizations may have a positive effect on greater student integration."

According to Dr Andrzej Czerwinski of the Bialystok Polytechnic, "The new regulations will not lead to any basic changes. It happens that the greater

personal authority for head of the institute only makes official a situation which already existed in practice in our college. Likewise, the increased representation of students by members of the youth organizations is in keeping with their real importance in the college. The main current of student life was already concentrated in the youth organizations."

According to Dr Andrzej Grzywacz, prorector of the Main School of Agriculture in Warsaw, "The new law on higher education may improve and shorten the time spent on making decisions in certain specific areas. I also consider that the student representatives chosen on a new basis, especially in the department councils, will more actively cooperate in social affairs of young people and in matters related to teaching and upbringing."

"We finished accepting new students in July," said Dr Czeslaw Glombik, prorector of the University of Silesia. "Because of the large surplus of applications for every area of studies, we have reached the limit of how many we can accept. Those candidates in the most popular areas of study for whom there were not enough places in the daytime section, were offered places in the correspondence section on condition that they work in education. Many people have taken advantage of that offer. The University is ready to begin work. In accordance with the recommendations of the ministry, we have revised the new study programs, which will be gradually instituted for beginning first year students. The new law will improve the functioning of the school. Many of the rules are in keeping with the practice of colleges and the principles of operative management. It is also important that in the collegial organs a decided majority is given to independent faculty members. In the affairs of the University their voice must be decisive."

#### New Szczecin University Described

Warsaw ZYCIE WARSZAWY in Polish 26 Sep 85 pp 1, 3

[Interview with Szczecin University rector Professor Kazimierz Jaskot, by Janina Paradowska]

[Excerpts] [Question] Only a few days are left before the beginning of the academic year at Szczecin University. Years of effort by local groups, supported by education circles throughout the country have led to a Sejm law creating the 10th university in Poland, which will shortly begin operation.

[Answer] The university will begin operation with almost 5200 students, including over 3200 day students. For the first year we have accepted almost 1200 persons, including about 800 for daytime studies.

[Question] The new university is based on the Pedagogical College and the Engineering and Economics Faculty of the Szczecin Polytechnic. The university will get its students from those schools. What about the staff? Will there be enough people, especially independent faculty members?

[Answer] This year we will have 109 professors and docents, as well as 10 doctores habilitati.

[Question] How many faculties does Szczecin University presently have?

[Answer] We have two large faculties: that of the Humanities, which consists of five institutes and three chairs, and that of Economics, also with five institutes and four chairs. We have our own computer center in the Economics faculty. In addition the University has a faculty of mathematics, physics and chemistry, as well as two institutes equal in status to faculties. These are the institutes of Law and Administration, and that of Physical Education. A faculty of Biology and Marine Sciences, and a research center for the countries of West Africa, Asia and Latin America are being organized.

[Question] What about promises coming from various academic circles? Many scholars have said that if a university-level institution were created in Szczecin, they would move to that city and support the new school with their knowledge.

[Answer] During the last two years, when the work on organizing the university was beginning to gain momentum, 21 independent teachers came to us. This process is continuing, and we believe that in the next two years the number of "imported" professors and docents will reach 40. We have an agreement with the University of Wroclaw in this area which is being consistently carried out, in addition to assistance from the University of Silesia and the Adam Mickiewicz University in Poznan. We also get independent teachers from institutes of the Polish Academy of Sciences.

[Question] From what you have said so far, one might get the impression that the University is starting up with no problems, but one can hardly believe that, since even much older institutions have innumerable problems.

[Answer] The biggest problem is new investments. In this respect the whole academic community in Szczecin has been neglected, with the possible exception of the Polytechnic, which has expanded in recent years. The most serious problem is the lack of housing for young teachers and students. If the investment program which has been approved is implemented according to plan (which it has been so far) the situation should improve in the next 2 years: a hotel for assistants and a dormitory will be put into operation.

Another problem is our collection of books. In some areas it is limited. That goes particularly for law and the exact sciences. But I must note with satisfaction that we have received great help in solving this problem from the Academy of Sciences, and also from universities, at least Warsaw University. If these institutions have duplicate copies in their collections, they send them to us. We also get many gifts from Polish scholars and also from many people not directly involved in education. We also receive gifts from abroad. For example, an American citizen of Polish origin is sending us a unique collection of mathematics journals. We therefore believe that during this year our library will be enriched, and that we will fill in the most troublesome gaps in this area.

If we speak of problems, obviously we still have a great shortage of independent faculty members. We are constantly looking for people in the exact



sciences. So far we have assembled a basic staff, but we hope, for example, to teach not just mathematics, but also its subdisciplines at the university level. In addition, like the majority of schools in Poland, we have problems buying the equipment necessary for new subjects. There are innumerable problems, and we know that we will not be able to solve them all at once.

[Question] In Szczecin the university is beginning to operate, but at the same time the Pedagogical College is ceasing to exist. The shortage of teachers in this region is just as great as in other parts of the country. Won't there be even less teachers now?

[Answer] In this matter the decisions were clear from the beginning: all the education subjects taught at the Pedagogical College must be continued at the University, and others must be developed. Thus, the number of trained teachers will grow. Even for this academic year we have accepted many people to study education. In addition, let us recall that all university graduates must take teaching courses. So we hope that when the University starts operation we will be better able to satisfy the regions' need for teachers.

[Question] Thank you for the interview.

#### Youth Plenum's Critical Self Analysis

Warsaw TRYBUNA LUDU in Polish 26 Sep 85 pp 1, 2

[Text] A critical plenum: that is the assessment one could hear quite often during the intermission of the third session of the Main Board (ZG) of the Union of Socialist Polish Youth (ZSMP), which took place on 25 September in Warsaw. And it is difficult not to agree with that opinion, knowing that it referred primarily to the ZSMP's own organizational weaknesses.

The plenum was devoted to the civic education of youth, a question discussed at length in the documents of the session. Past months have shown that the facts differ from expectations. "There is no reason to hide," said ZG ZSMP secretary Kazimierz Chrzanowski "that in everyday practice in some circles and organizations we sometimes forget that leading a social movement is not the same as organizing activities or dividing up the work..."

As was emphasized at the plenum, the Union must devote more attention to involving young people in the self-management system. In practice what we often observe at the workplace is the phenomenon of sham democracy and partnership, of merely apparent and formal activity. This must be prevented. Also of concern are shortcomings in the functioning of the schools. A youth organization cannot replace the school, but it can help it. Therefore the ZSMP will organize history universities for the schools, as well as young rationalist clubs, and it will conduct discussions, including with the unorganized, on Poland's past, it will serve as a patron for student democracy clubs, etc.

PZPR Central Committee Secretary Henryk Bednarski took the floor during the discussion. He said, "We are getting close to our goal. If we fight the

battle for social awareness with the practice of everyday life. Many upbringing programs have recently appeared. I believe we must rethink what to do so that educators and cadres should recognize the rules adopted as their own, so that they should not remain mere guidelines for writing reports. We will discuss these matters at upcoming CC plenary sessions devoted to education. I invite you young people to discuss the topics of those plenums. We want to formulate a program conscientiously, a program which will prepare Poles for life in the 21st century, for solving future problems, a program which will attract the younger generation in order to achieve a future vision of Poland. We want to form citizens who will not need to feel ashamed before their contemporaries."

The meeting was presided over by the chairman of the ZG ZSMP, Jerzy Szmajdzinski; also participating was PRON General Secretary Jerzy Jaskiernia.

#### Rectors of Art Schools Meet

Warsaw ZYCIE WARSZAWY in Polish 26 Sep 85 p 2

[Text] In Radziejowice near Warsaw a conference of Art School rectors took place. It was also attended by the secretaries of the school party organizations and the heads of the departments of military studies.

The organizational changes in higher education were discussed, as well as the upbringing tasks of the colleges for the academic year 1985-86. Present were Professor W. Nawrocki, head of the cultural section of the CC PZPR, and Professor K. Zygmunt, minister of culture and art.

#### Meeting of Technical School Rectors

Warsaw TRYBUNA LUDU in Polish 26 Sep 85 p 5

[Text] On 25 September a meeting of technical school rectors took place at the Wroclaw Polytechnical Institute. Participating were PZPR school committee secretaries, representatives of the other political parties, national trade unions and youth organizations. The meeting was attended by Professor Benon Miskiewicz, a representative of the Main Council on Science and Higher Education.

#### Academies' Rectors Discuss Changes

Warsaw TRYBUNA LUDU in Polish 27 Sep 85 p 2

[Text] On 26 September at a meeting in Warsaw of university and economic academy rectors it was emphasized that the new legal system of science and higher education as well as the sociopolitical and economic situation of the country will determine the course of development of colleges and their tasks. This was the last of a series of meetings of representatives of various types of colleges with ministry officials before the beginning of the new academic year. The meeting was presided over by Benon Miskiewicz, minister of science

and higher education. Also participating was Bronislaw Ratus, head of the Science and Education Section of the CC PZPR.

#### Proposed Ruling on Youth in Civic Affairs

Warsaw TRYBUNA LUDU in Polish 27 Sep 85 p 4

[Text] The Central Commission of Cooperation between the ZSMP, the ZMW, ZHP and ZSP proposes for public discussion a draft law on increasing the participation of youth in the sociopolitical, economic and cultural life of the country. The draft represents a consistent application of the resolution of the 11th CC PZPR plenum on tasks for work with youth, in which the Deputies' Club of the PZPR promises to introduce a bill on youth affairs to the SEJM.

Following are the most important theses set forth in the draft:

--The purpose of the law is to create the legal framework for expanding the participation of young people and youth organizations in the sociopolitical life of the country, in strengthening the state, socialist democracy and legality, productive activity and opportunities to improve the conditions for beginning life and one's profession, and opportunities for the intellectual, cultural and physical development of young people;

--Expanding youth participation in civic affairs is linked with proper fulfillment of basic civic obligations: diligent study, conscientious work, obedience to the law and principles of social life, combatting and counteracting manifestations of social pathology, worthy representation of Poland in international contacts, and socialist defense of the fatherland;

--The socialist upbringing of young people, the comprehensive development of their personality, talents and skills are the common concern of parents, schools, the workplace, socialist youth unions, voluntary labor brigades and other state institutions and social organizations; the patriotic-defense training of youth to defend the fatherland is an integral part of socialist upbringing;

--A special role in the patriotic-defense training of the younger generation is played by the Polish armed forces, forming patriotic and internationalist attitudes and civic responsibility for the country's future, developing moral-political values, creating conditions for the comprehensive development of soldiers' personality, for learning professional skills and participating in the political and social-cultural life of the nation;

--Management at the workplace and in cooperative organizations ensures the conditions for organizing various forms of collective labor for young people, fulfillment by them of production initiatives, including the creation of youth labor brigades, coordinating tasks related to the creation of such brigades with the leadership of the socialist youth unions;

--In order to carry out various forms of youth collective work, a workplace may employ high school and college students on the basis of labor agreements for a specific period of time;

--The Voluntary Labor Brigades also carry out tasks in the area of upbringing and professional and military training of youth; the basic tasks of the VLBs include: organizing voluntary youth labor in brigades, forming socialist consciousness, promoting vocational training and upgrading of skills, and creating conditions for draft age youth to perform civil defense service;

--Organs of state administration, schools, workplaces, socialist youth unions take the initiative in spreading scientific-technical knowledge among young people, creating clubs of technical progress for youth;

--Organs of state authority and administration, and workplaces are obligated to support young people's initiatives to promote environmental protection;

--The socialist youth unions may carry on economic activity in the form of their own enterprises, participation in companies, mixed enterprises and cooperatives, as well as sponsoring youth labor and housing construction cooperatives;

--The State Youth Fund is created; its income comes from funds generated by young citizens, allocations from the state budget, funds contributed by organizations uniting young people and working for the benefit of the younger generation, and other payments and gifts. They are exempt from taxes, and the amounts paid reduce the amount of tax of the payer;

--Monies from the Fund are intended primarily for: supplementary financing of activities arising out of the provisions of the present law, support for youth scientific-technical work, publishing, financing cultural-entertainment activity, sports and tourism, and also for financing assistance to orphans, children's homes and handicapped youth, and also to support social work by young people;

--Young people and the socialist youth unions, through their representatives in the people's councils and the Sejm, participate in legislation and the process of making decisions of state;

--The socialist youth unions are obligated to take an active part in the socioeconomic development of the country, and at the same time are the spokesmen for the interests of the younger generation, submitting to the state and economic administrations and to educational authorities conclusions, opinions, requests, legislative bills and opinions of draft laws; they participate in negotiations and monitor the implementation of decisions affecting youth.

--Central and field organs of state and economic administration when making decisions concerning youth, consult the socialist youth unions, submit draft documents to them, inform them of the status of implementation of decisions and invite representatives of youth organizations to their meetings;

--The socialist youth unions, in accordance with the principles of Polish foreign policy, enhance ties of friendship with the young people of the



socialist countries and their organizations, exchange experience, cooperate with progressive and democratic organizations of other countries, work toward strengthening peace and respect for the rights of children and young people.

#### Amended Student Self-Management Law Noted

Warsaw TRYBUNA LUDU in Polish 28-29 Sep 85 pp 1, 2

[Article by Tadeusz Belerski]

[Text] Under the revised law on higher education, the minister of science and higher education must determine the principles and forms for setting up and operating student self-management organs in colleges. The law also provides for a revision of the general framework of their activities. Recently an order of the minister has been issued, together with directions for implementing the general framework.

A PAP journalist was informed of the details of these documents by director of the Department of Upbringing and Student Affairs of the ministry, Eugeniusz Pietrasik.

"They define," he said, "the kinds of self-management organs, how they are created, what their rights and duties are. The basic student self-management cell will be the student group. The leader of such a group has a broad range of powers. He will deal with virtually every area of importance to students during their period of studies. For example, he has to participate in drawing up the class schedule and the schedule of examinations, he is consulted on the distribution of awards, and he also has to determine the material situation of his colleagues, and moreover participate in the allocation of state funds for the financial assistance of students.

In his work the leader must be guided by the opinion of the group. Since that is the basic self-management cell, this leads to the leader's position being expounded in other self-management organs. It is from among them that student leaders will be chosen self-management coordinators the this year. The faculty self-management council will consist of class leaders, while the college council will consist of chairmen of the faculty councils. Thus, under the proposed structure, in order to sit on the college council, one must first be elected a group leader. According to the law on higher education, the chairmen of the faculty and college councils will represent self-management in the collegial organs of the school, i.e., in the Faculty Council and the Senate.

The self-management framework provides for many powers of self-management organs. They will share decisionmaking power with the school authorities in matters of regulating studies, cooperate in matters of financial aid for students, in improving the pedagogical-upbringing process, in granting awards for good grades. At the same time, the duties of the self-management organs have been set forth, the fulfillment of which should help improve the quality of studies and shorten their duration, and also increase students' social involvement.

It is also provided that the schools will have self-management comrades' courts. If it works well, it could have referred to it matters which are usually by the rector's disciplinary commission for students. This would be of enormous value for upbringing. The laws also set forth the bases and scope of the most traditional forms of student self-management, the student home inhabitants' councils and the dormitory councils. The laws enable them to become virtual joint managers of the dormitories, and organizers of student life.

If self-management organs are to function properly for the good of the students and their integration, they must closely cooperate with student and youth organizations. The principles set forth in the framework clearly define the powers and activities of these organs and organizations. This section dispells many misunderstandings which have existed in the past.

The laws provide for a transitional period for their implementation, allowing for determination of self-management functions in the colleges and setting up the appropriate organs. This period is not stated precisely, but it is in the interest of the students to have a correct and rapid completion of the preparatory work and a beginning of self-management.

#### Army Medical Academy Opens New Year

Warsaw TRYBUNA LUDU in Polish 30 Sep 85 p 4

[Text] The ceremonial beginning of the new academic year for the Army Medical Academy in Lodz took place on 28 September.

Representatives of enterprises, social organizations, miners from the Belchatow coal mine as well as families and students from subsequent classes came. The main quartermaster of the Polish Army and vice-minister of national defense, General Mieczyslaw Obiedzinski was present, as well as political and administrative leaders of the province.

#### PRON Hosts IX Forum of Young Generation

Warsaw ZYCIE WARSZAWY in Polish 1 Oct 85 p 2

[Text] The conference room at the RF PRON headquarters could hardly accommodate all those who wanted to attend the 9th Forum of the Young Generation, at which the role of the young deputy in the Sejm was discussed on Monday. Thus the topic, as well as the opportunity to meet a few candidates for the Sejm, attracted young people, most of whom will vote for the first time in two weeks.

Opening the discussion, Jerzy Jaskiernia, RK PRON general secretary and Sejm candidate for the Krakow district, proposed concentrating on the need to set up a Circle of Young Deputies in the Sejm. At the conclusion of the meeting,

the floor was taken by the honorary guest of the forum, Vice-Chairman of the RK PRON and Sejm candidate from Krakow Professor Jerzy Ozdowski. He said that the rejuvenation of the Sejm is a healthy process which has already begun. Deputies of the 8th Sejm feel ever more acutely the need to combine the experience of the older deputies with the energy and enthusiasm of the younger ones.

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